

ERSH 8320: Applied Correlation and Regression Methods in Education
Spring Semester 2005, TR 12:30P-1:45P

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Course Description and Objectives

This course is designed to provide both a conceptual and more detailed statistical understanding of multiple regression. We will cover assumptions of the regression model, how model parameters are estimated and interpreted, applications of regression analysis, as well as other critical issues. The course will provide a valuable set of analytic tools for addressing research questions you may face during your academic or professional career. Many of the principles learned in this course are necessary for understanding more advanced statistical techniques (e.g., multivariate analysis, structural equation modeling, hierarchical linear models, etc.). So this course can be considered a gateway to other more advanced techniques.

Required Text

Pedhazur, E. J. (1997). *Multiple Regression in Behavioral Research, Third Edition*. New York: Wadsworth.

This textbook is a good resource to be familiar with if you will be conducting regression analysis or related methods in the future. It covers most regression-related topics in detail. Some passages may be challenging to comprehend on the first reading, but that is due mostly to the nature of the material rather than the book. All assigned course readings are from this text. Please complete them before class.

Supplementary Text

Kahane, Leo, H. (2001). *Regression Basics*. Thousand Oaks, CA: Sage Publications.

This text is not required, but is quite readable and also has some good practice problems and detailed examples. If you feel you need a more basic treatment of the core principals than Pedhazur provides, try this primer.

Assignments

An important component of this course is computer assignments using SPSS. The computer assignments are designed to develop the skills needed to run and interpret statistical analyses using real data. It is expected that students have had experience using SPSS in previous statistics courses. All assignments are due one week after they are assigned. All work should be well organized and neat. It is vital to your success in this course that you spend time working on these assignments.

Examinations

There will be three exams during the semester including two in-class midterms on February 20th and March 20th and an in-class final exam on May 4th at noon. The final exam time and date is based on the University's final examination schedule. Exam items may include computations, short answer, or multiple choice questions and will be derived from assignments, readings, and in-class material. While examinations are not cumulative, the nature of the material is. So while I won't specifically ask questions on material from previous tests, you may need to make use of that information to answer questions on the present test. On tests you can use a "study sheet" of your own making. For each exam you may use one 8.5 x 11 sheets of paper with notes on it.

Attendance

Attendance is extremely important. In the past, students who have missed class experienced difficulty. When a student misses class, the student misses an opportunity to check for understanding of the concepts being developed in the course and to ask appropriate questions. For these reasons, attendance is required. Students who accumulate more than 3 absences during the semester may be dropped from the class.

Grading

Final course grades will be based on performance on the computer assignments (total of 40%), and on the three examinations (20% each). Borderline grades will be determined based on class participation.

Final grades will be based on the following scale:

A = Excellent = 90% or higher

B = Good = 80% to 90%

C = Fair = 70% to 80%

D = Poor = 60% to 70%

F = Fail = below 60%

Academic Honesty

It is the student's responsibility to be familiar with the University of Georgia's policy on academic honesty as published in the booklet, *A Culture of Honesty: Policy on Academic Honesty*. This document is available on-line at [<http://www.uga.edu/ovpi/>]. Click on the *Academic Honesty* to view it. The University policy and regulations regarding academic honesty will be followed in this class. Any form of academic dishonesty will not be tolerated.

Comments on Learning Statistics: Statistics can be difficult for some people. Approaching this course with the following orientation will facilitate your learning.

- **It's not math, but it's like math.** The statistics we learn in this class do not require an understanding of advance math. But learning this material is similar to learning mathematics in that it must be practiced and repeated exposure is important if not essential. One has to read the text repeatedly, work on exercises, analyze different problems, and experience different analytic situations in order to absorb the information. *So, don't wait until the last minute to study for tests or work on assignments!*
- **It's similar to learning a foreign language.** Statistics uses a lot of symbols like Greek letters, subscripts, and sometimes superscripts, which makes it similar to learning a foreign language. Think of the symbols as a foreign language vocabulary that you must learn in order to understand the equations. A good first step in understanding a statistical equation is to read it aloud.
- **It's progressive.** Topics tend to build on each other. So make sure your confusions get addressed as we go or they will serve as barriers to future learning.

Class Schedule

Date	Topic	Reading
January 10	Introduction to Course	Ch. 1
January 12	Simple Correlation and Regression	Ch. 2, pp. 15-20
January 17	ANOVA Table (decomp. of sums of squares)	Ch. 2, pp. 20-25
January 19	Statistical Tests of Significance	Ch. 2, pp. 26-33
January 24	Lab #1	Simple Regression
January 26	Modeling Assumptions	Ch. 2, pp. 33-40
January 31	Regression Diagnostics	Ch. 3
February 2	Lab #2	Diagnostics
February 7	Review	-----
February 9	Midterm I	Ch. 1-3
February 14	Multiple Regression	Ch. 5, pp. 95-103
February 16	Multiple Regression (cont.) and Lab #3	Ch. 5, pp. 103-111
February 21	Prediction	Ch. 8, pp. 195-211
February 23	No Class (I will be away at a conference)	-----
February 28	Variable Selection and Lab 4	Ch. 8, pp. 211-225
March 2	Variance Partitioning	Ch. 9, pp. 241-262
March 7	Review	-----
March 9	Midterm II	Ch. 5-9
March 14	Spring Break (No Class)	-----
March 16	Spring Break (No Class)	-----
March 21	Open Date	-----
March 23	Analysis of Effects	Ch. 10, pp. 283-296
March 28	Categorical Independent Variables	Ch. 11, pp. 340-360
March 30	Categorical Independent Variables (cont.)	Ch. 11, pp. 360-367; 395-399
April 4	Lab #5	Dummy and Effect Coding
April 6	Multiple Categorical Variables	Ch. 12, pp. 410-425; 441-445
April 11	AERA Conference (No Class)	-----
April 13	Curvilinear Regression	Ch. 13, pp. 513-534
April 18	Continuous & Categorical Independent Variables	Ch. 14, pp. 560-582
April 20	Interaction	Ch. 14, pp. 583-592
April 25	Lab #6	Non-linear & Interaction Effects
April 27	Review	Ch. 10-14
May 4	Final Exam (noon)	-----

Note: this schedule may change depending on how we progress.