

ERSH 8320: Applied Correlation and Regression Methods in Education
Fall Semester 2005, TR 2:00P-3:15P

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Office hours: TR 10:45-11:30A and 3:15-4:00P or by appointment

Course Description and Objectives

This course is designed to provide a broad understanding of multiple regression. The course will provide a valuable set of analytic tools for addressing research questions you may face during your academic and professional careers. Many of the principles learned in this course are also important for understanding more advanced statistical techniques (e.g., multivariate analysis, structural equation modeling, hierarchical linear models, etc.). Through this course you will gain insight into what statistics can tell us about data. The focus will be on applications, interpretations, and developing a conceptual understanding of the underlying statistical principles.

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 on actual data. It is expected that students will 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 September 20th and October 20th and a final exam on December 13th at 3:30 PM. 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 and formulas on it.

Attendance

Attendance is extremely important. In the past, students who have missed class experienced difficulty. When a student misses class, he or she misses an opportunity to check 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 (8% each, drop the lowest score, for a 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 = above 90%

B = Good = between 80% and 90%

C = Fair = between 70% and 80%

D = Poor = between 60% and 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.

Comments on Learning Statistics: You may agree that statistics can be difficult. 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
August 18	Introduction to Course	Ch. 1
August 23	Simple Correlation and Regression	Ch. 2, pp. 15-20
August 25	ANOVA Table (decomp. of sums of squares)	Ch. 2, pp. 20-25
August 30	Statistical Tests of Significance	Ch. 2, pp. 26-33
September 1	Lab #1 (room 618)	Simple Regression
September 6	Modeling Assumptions	Ch. 2, pp. 33-40
September 8	Regression Diagnostics	Ch. 3
September 13	Lab #2 (room 618)	Diagnostics
September 15	Review	-----
September 20	Midterm I	Ch. 1-3
September 22	Multiple Regression	Ch. 5, pp. 95-103
September 27	Multiple Regression (cont.)	Ch. 5, pp. 103-111
September 29	Lab #3 (room 618)	Multiple Regression
October 4	Prediction	Ch. 8, pp. 195-211
October 6	Variable Selection	Ch. 8, pp. 211-225
October 11	Variance Partitioning	Ch. 9, pp. 241-262
October 13	Lab #4 (room 618)	Variable Selection
October 18	Review	-----
October 20	Midterm II	Ch. 5-9
October 25	Analysis of Effects	Ch. 10, pp. 283-296
October 27	No Class (University Fall Break)	-----
November 1	Categorical Independent Variables	Ch. 11, pp. 340-360
November 3	Categorical Independent Variables (cont.)	Ch. 11, pp. 360-367; 395-399
November 8	No Class (I will be attending a conference)	-----
November 10	Lab #5 (room 618)	Dummy and Effect Coding
November 15	Multiple Categorical Variables	Ch. 12, pp. 410-425; 441-445
November 17	Curvilinear Regression	Ch. 13, pp. 513-534
November 22	Continuous & Categorical Independent Variables	Ch. 14, pp. 560-582
November 24	No Class (Thanksgiving Holiday)	-----
November 29	Interaction	Ch. 14, pp. 583-592
December 1	Lab #6 (room 618)	Non-linear & Interaction Effects
December 6	No Class (University is on a Friday schedule)	-----
December 8	Review	Ch. 10-14
December 13	Final Exam 3:30 pm	-----

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