

Quantitative Methods in Education III: Regression
16:300:519
Spring 2011

Course Syllabus

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Office hours:	Monday, 3:00-4:00, or by appointment
Time:	Monday, 4:50 – 7:30 PM
Place:	Room 208, Graduate School of Education
References:	TBA
Software	<i>SPSS Statistics 19.0</i> . Chicago: SPSS Inc.
Packages:	<i>Ox Console (Version 6.0)</i> . Download for free at www.doornik.com .

Course Description

This course focuses on techniques for analyzing non-experimental data, primarily multiple regression analysis. The purpose of the course is to help students gain an understanding of the how data are analyzed and interpreted in non-experimental research. Topics covered in this class include matrix algebra, maximum likelihood estimation, multiple, partial and semi-partial correlations, regression diagnostics, model selection, dummy coding, analysis of covariance, and logistic regression.

Course Requirements

- 1) **Exams:** The two in-class exams, midterm and final, are worth at least 30% and 50% of the final grade, respectively (see formula below for computing the Final Score). The exams may consist of multiple choice items, computations, and short answer/essay questions.
- 2) **Homework assignments:** Approximately 12 homework assignments (worth a maximum 20% of the final grade) will be given throughout the semester. No late homework assignments will be accepted, but only the 10 highest homework assignment scores will be used. Homework assignments are required to be submitted via eCompanion, and multiple submissions are allowed within the availability period.

Each of the three components (homework assignments, midterm and final exams) will be out of 100 points. The final score will be computed as,

$$\text{Final Score} = \left(\frac{20\% \times \text{HWA} + 30\% \times \text{Midterm} + 50\% \times \text{Final}}{80 + 20\% \times \text{HWA}} \right) \times 100\% .$$

The final letter grade will be assigned as follows:

Final Score	Letter Grade
90% and Above	A
80%-89%	B+
75%-79%	B
65%-74%	C+
60%-64%	C
Below 60%	F

SPSS Statistics will be used extensively to conduct statistical analyses for homework assignments and class exercises. However, for the exams, a calculator that performs basic operations will suffice.

Ox will be the programming language used for matrix manipulations and computations.

Reading assignments must be completed prior to each lecture.

Class Schedule

The following class schedule is subject to change if necessary.

Date	Topic	Assigned Reading
January 23	Background and Review	2 & 3
January 30	Introduction to Simple Linear Regression	(4), 5-6.5
February 6	Correlation Coefficient and ANOVA Table	6.6-8
February 13	Multiple Regression	9 & Appendix B
February 20	Matrix Approach to Linear Regression	(Neter et al.)
February 27	Correlations, Confounding & Interactions	10 & 11
March 5	Dummy Variables in Regression	12
March 12	<i>Spring Break</i>	
March 19	MIDTERM EXAM	
March 26	Analysis of Covariance	13
April 2	Regression Diagnostics	14
April 9	Polynomial Regression	15
April 16	Model Selection	16
April 23	<i>Logistic Regression</i>	23
April 30	<i>Analysis of Correlated Data</i>	25 & 26
May 7	FINAL EXAM (Cumulative)	