

Quantitative Methods in Education III: Regression
16:300:519
Spring 2014

Course Syllabus

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Office hours:	Monday, 3:50-4:50, or by appointment
Time:	Monday, 4:50 – 7:30 PM
Place:	Room 208, Graduate School of Education
Reference:	Kutner, M. Nachtsheim, C. &, Neter, J. (2005). <i>Applied Linear Regression Models (4th ed.)</i> . New York: McGraw Hill.
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. 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 Goals and Objectives The goals of the course are to help students

- 1) gain an understanding of how data are analyzed and interpreted in non-experimental research;
- 2) recognize the different situations under which the use of multiple regression analysis is appropriate; and
- 3) implement standard and nonstandard regression analyses in SPSS.

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 11 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 27	Review and Overview	1.1-1.2
February 3	Regression Model, Estimation and Inferences	1.3-1.5, 2.1-2.5
February 10	Inferences (II); Diagnostics and Remedial Measures	2.7-3.3
February 17	RM (II); Matrix Approach to Simple Linear Regression	3.8-3.9; 5
February 24	Matrix (II); Multiple Regression I	6
March 3	Multiple Regression II	7
March 10	Models for Quantitative and Qualitative Predictors	8
March 17	<i>Spring Break</i>	
March 24	MIDTERM EXAM	
March 31	Analysis of Covariance	Supplement
April 7	Model Selection and Validation	9
April 14	Diagnostics and Remedial Measures	10, 11
April 21	Logistic Regression	14.1-14.5
April 28	Analysis of Correlated Data	Supplement
May 5	Catch Up/Review	
May 12	FINAL EXAM (Cumulative)	

ACADEMIC INTEGRITY POLICY

Please comply with standards of academic integrity in this course. For the homework assignments, you are allowed to work with your classmates; however, submitted works should be of your own. For the exams, you are not allowed to work with or request help from anyone. The consequence for violating policies of academic integrity and other elements of the student code of conduct are serious and can have a tremendous negative impact on your academic progress and future career. Please familiarize yourself with the university policy on academic integrity: <http://studentconduct.rutgers.edu/academic-integrity>.

Policy on Academic Integrity

Please refer to the Policy on Academic Integrity for Undergraduate and Graduate Students at <http://academicintegrity.rutgers.edu>.

The University Code of Student Conduct can be accessed at:
<http://studentconduct.rutgers.edu/university-code-of-student-conduct>

Related regulations may also be found in the Rutgers Graduate School of Education Catalog.

Clear evidence of violation of academic integrity policy may result in a grade of *F* for the assignment AND the course.