

Spring 2016  
Quantitative Research Methods in Education: Regression  
16:300:519:01  
3 Credits  
Monday 4:50 - 7:30 PM  
GSE Room 208

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<b>Instructor Name:</b> Nathan Minchen	<b>Email:</b> nathan.minchen@gse.rutgers.edu
<b>Phone Number:</b> Please use email	<b>Office:</b> GSE Room 304
<b>Office Hours:</b> Monday, 3:50 – 4:50pm, or by appointment	<b>Prerequisites or other limitations:</b> Statistical Methods II, or Quantitative Research Methods in Education I
Mode of Instruction: <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input type="checkbox"/> Hybrid <input type="checkbox"/> Online <input type="checkbox"/> Other	Permission required: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Directions about where to get permission numbers:

**Learning Goals:**

This course is intended to prepare students to incorporate quantitative research methods into their research by fitting and interpreting linear models to data sets in the software of their choice. Additionally, students should be able to apply their understanding of linear modeling when evaluating research methods of studies/papers.

**Course Catalog Description:**

The course will focus on analyzing and interpreting observational (non-experimental) data. The topics covered include fitting regression models, evaluating model fit, conducting model selection, and controlling for covariates. Statistical details of the applications, such as maximum likelihood estimation, heteroscedasticity, and best linear unbiased estimators, will be discussed.

**Textbook:**

(Required): Kutner, M. Nachtsheim, C. &, Neter, J. (2005). *Applied Linear Regression Models (4th ed.)*. New York: McGraw Hill.

(Recommended for students interested in learning R - Available free of charge on RU online library): Sheath, Simon J. (2009). *A Modern Approach to Regression with R*. New York: Springer.

**Software:**

SPSS Statistics 19.0. Chicago: SPSS Inc.

R version 3.2.2 (in conjunction with R Studio)

**Course Requirements and Grading:**

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,

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

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

Web site: eCompanion (eCollege)

Software will be used extensively to conduct statistical analyses for homework assignments and class exercises. Any statistical software is acceptable. For the exams, a calculator that performs basic operations will suffice.

Please complete reading assignments prior to each lecture.

**Course Schedule:**

Please note that this schedule is subject to changes as necessary.

Date	Topic	Lecture Notes #	Readings
January 25th	Review and Overview	1	1.1-1.2
February 1	Estimation and Inferences in Regression Analysis	2	1.3-1.5, 2.1-2.5
Feb 8th	Inferences (Cont'd); Diagnostics and Remedial Measures	3	2.7-3.3
Feb 15th	Matrix Approach to Simple Linear Regression	4	3.8-3.9, 5
Feb 22nd	Multiple Regression I	5	6
Feb 29th	Multiple Regression II	6, 7	7
March 7 <sup>th</sup>	Models for Quantitative and Qualitative Predictors	8	8
March 14 <sup>th</sup>	Spring Break		
March 21 <sup>st</sup>	MIDTERM EXAM		
March 28 <sup>th</sup>	Analysis of Covariance	9	Supplement
April 4 <sup>th</sup>	Model Selection and Validation	10	9
April 11 <sup>th</sup>	Diagnostics and Remedial Measures	11	10,11
April 18 <sup>th</sup>	Logistic Regression	12	14.1 - 14.5
April 25 <sup>th</sup>	Selected Topics		
May 2nd	REVIEW		
May 9 <sup>th</sup>	FINAL EXAM		Cumulative

**Academic Integrity Policy:**

The Office of Student Conduct supervises issues related to violations of academic integrity (see <http://academicintegrity.rutgers.edu>). Please familiarize yourself with the university policy on academic integrity at [http://academicintegrity.rutgers.edu/files/documents/AI\\_Policy\\_2013.pdf](http://academicintegrity.rutgers.edu/files/documents/AI_Policy_2013.pdf)

**Office of Disability Services:**

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.