

EPRS8550
Quantitative Methods and Analysis in Education III
Regression Analysis
Summer 2020

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Office Hours: By Appointment

Course Requirement

Location: 100% online
Dates: 6/8/2020 – 7/27/2020

Textbook: Pedhazur, E. J. (1997). Multiple Regression in Behavioral Research: Explanation and Prediction (3rd Edition) New York: Holt, Rinehart and Winston. (Recommended – Main Textbook)

Garson, G. D. (2012). *Multiple Regression*. Asheboro, NC: Statistical Associates Publishers. (Optional – Kindle Version is \$5.00
<http://www.statisticalassociates.com/regression.htm>)

Pituch, A. & Stevens, J. (2016). Applied Multivariate Statistics for the Social Sciences. (6th Edition). Routledge. (Optional – Need only one chapter. This is a textbook for your next class EPRS9550.)

Software: SPSS (Internet access available at vLab.gsu.edu).
If you have your own SPSS, Version 19 or higher will work for this course.

Prerequisite: Quantitative Methods and Analysis in Education I (EPRS8530) or equivalent
Quantitative Methods and Analysis in Education II (EPRS8540) or equivalent

Assignments: There will be four homework assignments. The due date will be specified by the instructor, and graded on the 10 point scale. **Since it is graded, students are expected to work on the assignment INDEPENDENTLY.** Questions concerning the assignments should be directed to the instructor. The lowest of the four scores will be dropped before calculating the mean assignment score. **Please note that you need to complete all four assignments for you to be able to drop the lowest score.** The assignment includes computer work.

Exams: Exam 1 due Week 4 Monday 6/29
Exam 2 due Week 8 Monday 7/27

Grades: Course grade = .35*Exam 1 + .35*Exam 2 + .30*assignment

Cutting scores of 90%, 80%, 70%, 60%, and 0% will apply for grades A, B, C, D, and F, respectively. All the requirements have to be completed to obtain credits for the class. Make-up exams will be given with the instructor's permission.

Participation will not be graded. However, active participation online (via discussion, e-mail, etc. on iCollege) is required and expected. If the instructor notices a lack of participation, a notice will be given to the student via e-mail in iCollege. After two such notices, if the student fails to actively participate, then **the course grade will be lowered by 10%**.

Academic Honesty:

Please see the section of the general catalog which describes the university policy on academic honesty. The policy provides descriptions of what violates the policy and of what penalties may be imposed for violations. Departmental policy authorizes professors to assign failing grades for any work which does not meet the standards of academic honesty. Any violation of academic honesty can result in a failing grade in a course.

Please note that all exams and assignments are done INDEPENDENTLY. As this is an online course, exams and assignments are open book and students can also use the Internet. **However, students cannot seek help from other individuals for exams and assignments.** Any questions should be discussed openly in the discussion board (DB) in iCollege. **Work not performed independently will result in a failing grade.**

Note: The last day to withdraw and receive a W is 7/6/2020.

Course Overview

This course is designed to introduce regression analysis as a statistical tool in understanding the relationship between a single dependent variable and one or more independent variables. While the variables can be either quantitative or qualitative, we will focus on the cases where both dependent and independent variables are continuous. However, cases with a single qualitative variable will be introduced so that the previously introduced ANOVA and ANCOVA can be seen as parts of a general regression approach. As time permits, more advanced techniques using regression analysis may be introduced briefly. The course consists of the following 7 units:

Regression analysis with:

- I. one quantitative independent variable (Simple Linear Regression)
- II. two quantitative independent variables (Multiple Regression)
- III. multiple quantitative independent variables (Multiple Regression)
- IV. multiple independent variables with interaction (Moderation Analysis)

V. one qualitative independent variable (ANOVA)

VI. one quantitative and one qualitative independent variable (ANCOVA)

VII, one dichotomous dependent variable (Logistic Regression)

General Objectives

The student will be able to:

- (1) distinguish among various regression designs.
- (2) run regression analysis on the computer and interpret the results.
- (3) describe ANOVA in the context of regression.
- (4) apply regression analysis to a real data problem.

Course Outline

***Please see a more detailed outline on my Web: <http://coeweb.gsu.edu/coshima/>.

Week	Topic	Chapter
1.	Introduction Simple Linear Regression	1-2
	Computers	4
2.	Regression analysis with two quantitative independent variables Moderation/Mediation Analysis	5 Hayes 4 & 7
	Matrix Operations	6
3.	Partial and Semipartial Correlation	7
	Regression Diagnostics How many subjects?	3
4.	Exam 1 Regression analysis with multiple quantitative independent variables Prediction Model Validation	8-10
5.	Regression analysis with multiple quantitative independent variables (contd.) Model Selection	8-10 Pituch & Stevens 3
	Regression analysis with one qualitative independent variable t-test ANOVA	11
6.	Regression analysis with one quantitative and one qualitative independent variable ANCOVA Johnson-Neyman Procedure	14-15
	Logistic Regression	Pituch & Stevens 11
7.	More Topics Exam 2	

This course syllabus provides a general plan for the course; Deviation may be necessary.

Overview of the Online EPRS8550

Welcome to the 100% Online EPRS8550. In this course, instructions will be given using the multimedia technology via iCollege (Brightspace/D2L – Note: I will use the name “iCollege” instead of “Brightspace/D2L” throughout the semester.). The instructional materials include online videos, online resources, and of course, traditional textbooks. Learning outcome will be assessed via assignments and exams.

1. Meeting Times: We will not meet face-to-face in this course. However, we will be “meeting” and communicating in the cyber space throughout the course. Students are expected to keep up with the pace by following the outline posted on my Web. In the outline, specific videos and reading materials are presented week by week. This is a non-synchronous online course to allow a maximum flexibility for students. The instructors will be available through email in iCollege during the week.

2. System Requirements: Each student needs to have an access to internet. A fast access to internet (DSL, etc.) is strongly recommended. Students will have an access to videos, etc. via iCollege. Other materials (handouts, etc.) are also available on my Web site.

3. Computer Knowledge: No special computer knowledge is necessary beyond basic computer skills. If one can use iCollege and knows how to visit Web sites, then he or she is ready for this course. Software knowledge of Excel or SPSS from Quant 1 and Quant 2 is expected. SPSS will be used in this course. SPSS is available to all GSU students via VCL.GSU.edu.

4. Communications: Communications between the instructor and students and among students are maintained in the discussion board (DB) and e-mail in iCollege. Students are expected to check iCollege as often as possible during the week, daily if possible. Students are responsible for reading the announcements from instructor (under DB1). The communication is open all the time. The instructor will do her best to reply within 24 hours on weekdays. Please understand that there is no reply/posting from instructor on Sundays.

5. Learning Outcome: The assignments and exams will be turned in via iCollege using the Dropbox Tool. The details of the exams will be announced later. Exam 1 covers the first half of the course and Exam 2 covers the second half of the course.

6. Virtual Office Hours (WebEx): The instructor is available to “meet” using WebEx. Please email the instructor first to set up the time.

7. Participation: Participation is very important in an online course. You will be expected to participate actively and to **contribute substantive discussion messages as much as possible**. Please note that both quantity and quality are important considerations when it comes to participation. For example, a message which says simply, "I agree," does not constitute participation, because it does not add anything of substance to the discussion. You must add something of substance to the discussion on each occasion—this would consist of new

ideas, your perspectives, pointed follow-up questions, etc.

8. Tips:

- Assignments/Projects:
 - Assignments and exams are returned with comments. Be sure to read comments entered in the Feedback. If you have multiple submissions, comments will be appended in the Feedback.
 - When you turn in files, please name each file as follows. Suppose your name is Joe Smith. Your file name for Assignment 1 will be: Joe_Smith_Assignment_1.doc. If you revise and resubmit, then the file name will be: Joe_Smith_Assignment_1_Revised_1.doc. If you revise and resubmit one more time, then it will be: Joe_Smith_Assignment_1_Revised_2.doc. The extension (*.doc) may differ according to the software.
- WebEx
 - Available in iCollege (Learning Tools – Online Rooms).
 - Please release the microphone button when you finish talking.
- Pace
 - The course moves week by week. There are discussions on DB (Discussion Board) during the week and an assignment or an exam is due every Monday.
- iCollege
 - Please use iCollege for all the communications, including e-mail and submissions of assignments and exams.
 - In the past, students experienced occasional problems with attachment in iCollege. If that happens, you may want to exit iCollege and come back in and try again. That sometimes solves the problem.
 - Check iCollege often, every day if all possible.
- General Advice
 - An online course saves time in commuting and parking, etc., but it will not save time in learning. It takes just the same time to study the materials as the face-to-face course does. The online course would be most suitable for individuals who are busy but extremely motivated to learn and who are good at time management.

How to get started:

Step 1: Students will receive an email from the instructor in iCollege.

Step 2: Read Syllabus and Outline, watch Introduction Video, and read Orientation Handout in iCollege. Take the Orientation Test and achieve 100%.

Step 3. Reply the instructor's first email and confirm that everything is in working order.

Step 4. Start!

Our goal is to help you learn quantitative methods as effective and enjoyable as possible. If there are any comments/feedback/requests, please feel free to e-mail me at any time oshima@gsu.edu.

GOOD LUCK!

5/25/2020