EPY 732, 1001 & 1002
Multiple Regression and Path Analysis
(3 credits)
Spring 2017
EPY 732-1001 CEB 216; Wed. 4 - 6:45PM
EPY 732-1002 CEB 210; Wed. 7 - 9:45PM

Instructor: Dr. Tiberio Garza
Office: CEB 334 (TBA and by appointment)
Phone: 895-3246
E-mail: tiberio.garza@unlv.edu
Prerequisites: EPY722 or equivalent (inferential statistics and experimental design)

Course Description
Intermediate-level inferential statistics for experimental and non-experimental educational research covering general linear models including analysis of variance, regression (simultaneous, variable- selection, hierarchical approach), and path analysis, integrated with the use of statistical computer packages.

Course Objectives
Knowledge
- Understand zero-order, semi-partial, and partial correlation and statistical control.
- Understand terms common to regression analysis.
- Understand various applications of regression analysis.
- Understand path coefficient, path models, and terms common to path analysis.

Skills
- Compute regression and path analysis and interpret results.
- Utilize computer programs for the analysis of empirical data.
- Employ statistical procedures correctly in the analysis of educational problems.
- Interpret educational research studies with particular emphasis on the correctness of the employed statistical procedures.

Dispositions
- Increased interest in educational research.
- Enhanced motivation in conducting research for improving education.

Outcome
Students of EPY732 should be able to:
- Demonstrate their understanding of statistical concepts on multiple regression and analysis of variance.
- Select correct statistical procedures for various research situations.
- Analyze data utilizing appropriate statistical computer procedures for each statistical concept area.
- Interpret the results of data analysis using standard reporting approaches.
- Appreciate empirical research articles with enhanced understanding of statistical concepts and procedures.

Textbook

Keith, T. Z. (2015). *Multiple regression and beyond: An introduction to multiple regression and structural equation modeling* (Second Edition). New York, NY: Routledge.

- Chapters 1 through part of Chapter 3 can be found here http://samples.sainsburysebooks.co.uk/9781317608066_sample_856701.pdf
- ISBN: 978-1-138-81194-2 (hbk)
- ISBN: 978-1-138-81195-9 (pbk)
- ISBN: 978-1-315-74909-9 (ebk)

Recommended Statistical Reference Guides

Various *SPSS* statistical procedures companion books are available at www.spss.com or www.prenhall.com (e.g., *SPSS Base User's Guide*; *SPSS Guide to Data Analysis; SPSS Statistical Procedures Companion*)

Supplementary Articles

Gully, S. M., Payne, S., Koles, K. L. K., Whiteman, J. K. (2002). The impact of error training and individual differences on training outcomes: An attribute-treatment interaction perspective. *Journal of Applied Psychology, 87,* 143-155.

Haig, B. D. (2003). What is a spurious correlation? *Understanding Statistics, 2,* 125-132.

Huberty, C. J. (2003). Multiple correlation versus multiple regression. *Educational and Psychological Measurement, 63,* 271-278.

Maassen, G. H., & Bakker, A. B. (2001). Suppressor variables in path models. *Sociological Methods and Research, 30,* 241-270.

Mills, P. E., Dale, P. S., Cole, K. N. (1995). Follow-up of children from academic and cognitive preschool curricula at age 9. *Exceptional Children, 61,* 378-398.

Paulhus, D. L., Robins, R. W., Trzesniewski, K. H., Tracy, J. L. (2004). Two replicable suppressor situations in personality research. *Multivariate Behavioral Research, 39,* 303-328.

Shieh, G. (2006). Suppression situations in multiple linear regression. *Educational and Psychological Measurement, 66,* 435-447.

Weinberg, S. (1982). Path analysis. In H. E. Mitzel (Ed.) *Encyclopedia of Educational Research* (Vol. 3). (5th ed). New York, NY: Free Press.

Wendorf, C. A. (2004). Primer on multiple regression coding: Common forms and the additional case of repeated contrasts, *Understanding Statistics, 3,* 47-57.

Wilson, P. M., Blanchard, C. M., Nehl, E., & Baker, F. (2006). Predicting physical activity and outcome expectations in cancer survivors: An application of self-determination theory. *Psycho-oncology, 15,* 567-578.

Woehr, D. J., & Cavell, T. A. (1993). Self-report measures of ability, effort, and nonacademic activity as predictors of introductory psychology test scores. *Teaching of Psychology, 20,* 156-160.

Wilcox, R. R., & Keselman, H. J. (2004). Robust regression methods: Achieving small standard errors when there is heteroscedasticity. *Understanding Statistics, 3,* 349-364.

Performance Assessments and Grading

General rules on assignments and grading

- No late assignments and no incompletes will be granted except for extremely unusual circumstances.
- Cheating or plagiarism will result in an automatic "F" for the course.
- Failure to attend classes (three or more) will result in a lower grade with a highest possible grade of B+. It is the student's responsibility to explain the reason for missed classes

Grades are based on the following:

Activity	Points	Description
1) Exercise Problems	20 points each	Questions at the end of the chapter
2) Class Participation/Discussion	20 points each	Discussion on end of chapter questions
3) Group Presentation (Ch. 2-14)	300 points	Chapter summary (Ch. 2-14)
Group Presentation (Ch. 15-21)	330 points	Chapter summary (Ch. 15-21)

1) Exercise Problems (240 points or 20 points * 12)
Practice is essential for learning. For this reason, the attempting of exercise questions at the end of each chapter will be counted towards your final grade.

- In this course, we have **12 sets of exercise problems**. Each set of exercise problems ranges from 3 to 7 questions. You will receive **20 exercise problem points for each** complete attempted set of exercise problems.

2) Class Participation/Discussions (240 points or 20 points * 12)
Engaged learning is critical for learning. For this reason, class participation and discussion will be counted towards your final grade.
- In this course, we have **12 structured class discussions.** You will receive **20 participation points for each** structured class discussion, given you present, attentive, and engaged in the discussion. **Points are given per the instructors' discretion.**
- Absences will **additionally** affect participation/discussion points. See "Attendance and Collaborative Engagement" under "Grading Policy" below.
- **In-class discussions cannot be made up** unless arrangements are made with the instructor more than two weeks prior to a planned absence. In the case of an emergency absence, **with proper documentation**, other arrangements may be made with the instructor after the emergency absence.

3) Group Presentation (300 or 330 points * 1)
Presenting of content area solidifies and extends learning. For this reason, group presentations will be counted towards your final grade.

- In this course, you are to form a **group of 2 to 3 people** and conduct a chapter summary presentation. As a group, you are free to choose the format and delivery of your presentation.
- Your presentation should **last between 45 to 60 minutes**. A Chapter Summary can be on **any chapter between 2 and 21**. Because our course only covers up to Chapter 14, **Chapter 15 and above Group Presentations will require pre-approval** from the instructor.
- **Beginning March 22nd students will establish their groups and have decided their chapter summary**. Chapter Summaries may occur at the beginning, middle, or toward the end of each class period and is at the discretion of the instructor. **Group members should consult with the instructor prior to conducting their Group Presentation on a particular date and time during class**.

Group Presentation Rubric			
	Not acceptable	Adequate	Excellent
Time and group management	0 points The presentation was poorly within the time allotted and poorly involved all group members	75 points The presentation was somewhat within the time allotted and somewhat involved all group members	100 points The presentation was within the time allotted and involved all group members
Presentation	0 points Presentation is delivered poorly – with little organization or not delivered at all	75 points Presentation is organized, delivered, and somewhat engages the audience	100 points Presentation is well organized, delivered, and engages the audience
Content	0 points Knowledge of content is poorly executed with little or no reference to materials learned in class and/or in the textbook	75 points Knowledge of content is executed with some references to the material learned in class and/or in the textbook	100* points Knowledge of content is well executed and makes strong connections between the content learned in class and/or in the textbook

Note. Total Maximum Points = 300 or 330. *30 additional points are awarded to Group Presentations with a topic from Chapters 15 through 21.

The graded exercise problems, class participation/discussions, and group presentation will be combined for the final grade. A letter grade will be assigned to the corresponding competency level (excellent, good, moderate$^{+,0,-}$, fair, marginal, and deficient) on the following learning outcomes: (1) understand statistical concepts; (2) use correct statistical procedures; (3) utilize appropriate statistical computer procedures; (4) interpret the findings.

Competency level	Letter grade	Points earned
Excellent	A	96% ~ (768 points and above)
Good	A-	91% ~ (728 ~ 767 points)
Moderate$^+$	B+	88% ~ (704 ~ 727 points)
Moderate^0	B	85% ~ (680 ~ 703 points)
Moderate$^-$	B-	81% ~ (648 ~ 679 points)
Fair	C-, C, C+	71% ~ (568 ~ 647 points)
Marginal	D-, D, D+	61% ~ (488 ~ 567 points)
Deficient	F	below 60% (below 480 points)

Computer labs
If you do not own SPSS, use public computer labs for your homework assignments. Computing services change lab hours periodically and open new labs or close existing ones; so check the computing facilities website (http://oit.unlv.edu/labs-classrooms/labs). The library GSA area (3rd floor) is a good place to start. Other labs with SPSS include CEB 309A, CBC B131, and student union. You must have your UNLV ID card with you to use any public computer lab.

Class Schedule (subject to change)

Class	Topic	Reading	Assignments
Jan 18	Introduction & Simple (Bivariate) Regression	Ch. 1	Exercises 1- 5
Jan 25	Multiple Regression: Introduction	Ch. 2	Exercises 1- 4; Discussion Ch. 1
Feb 1	Multiple Regression: More detail	Ch. 3	Exercises 1- 4; Discussion Ch. 2
Feb 8	Three and More Independent Variables and Related Issues	Ch. 4	Exercises 1- 6; Discussion Ch. 3
Feb 15	Three Types of Multiple Regression	Ch. 5	Exercises 1- 5; Discussion Ch. 4
Feb 22	Analysis of Categorical Variables	Ch. 6	Exercises 1- 3; Discussion Ch. 5
Mar 1	Categorical and Continuous Variables	Ch. 7	Exercises 1- 7; Discussion Ch. 6
Mar 8	Continuous Variables: Interactions and Curves	Ch. 8	Exercises 1- 6; Discussion Ch. 7
Mar 15	Multiple Regression: Summary, Assumptions, Diagnostics, Power, and Problems	Ch. 9	Exercises 1- 3; Discussion Ch. 8
Mar 22	Related Methods: Logistic Regression and Multilevel Modeling	Ch. 10	Group Presentations may begin; Discussion Ch. 9
Mar 29	Path Modeling: Structural Equation Modeling with Measured Variables	Ch. 11	Exercises 1- 7
Apr 5	Path Analysis: Dangers and Assumptions	Ch. 12	Exercises 1- 3; Discussion Ch. 11
Apr 12	No Class – Spring Break		
Apr 19	Analyzing Path Models Using SEM Programs	Ch. 13	Exercises 1- 7; Discussion Ch. 12
Apr 26	No Class – AERA		
May 3	Error: The Scourge of Research	Ch. 14	Discussion Ch. 13

UNLV and COE policies

Academic Misconduct – Academic integrity is a legitimate concern for every member of the campus community; all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path. Students enrolling in UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's function as an educational institution.

An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the *Student Academic Misconduct Policy* (approved December 9, 2005) located at: https://www.unlv.edu/studentconduct/student-conduct

Copyright – The University requires all members of the University Community to familiarize themselves **with** and to follow copyright and fair use requirements. **You are individually and solely responsible for violations of copyright and fair use laws. The university will neither protect nor defend you nor assume any responsibility for employee or student violations of fair use laws.** Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional information can be found at: http://www.unlv.edu/provost/copyright.

Disability Resource Center (DRC) – The UNLV Disability Resource Center (SSC-A 143, http://drc.unlv.edu/, 702-895-0866) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

Religious Holidays Policy – Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor no later than the end of the first two weeks of classes, **January 31, 2017**, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit: http://catalog.unlv.edu/content.php?catoid=6&navoid=531.

Transparency in Learning and Teaching – The University encourages application of the transparency method of constructing assignments for student success. Please see these two links for further information:
https://www.unlv.edu/provost/teachingandlearning
https://www.unlv.edu/provost/transparency

Incomplete Grades – The grade of I – Incomplete – can be granted when a student has satisfactorily completed three-fourths of course work for that semester/session but for reason(s) beyond the student's control, and acceptable to the instructor, cannot complete the last part of the course, and the instructor believes that the student can finish the course without repeating it. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. Graduate students receiving "I" grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the time indicated, a grade of F will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not register for the course but make individual arrangements with the instructor who assigned the I grade.

Tutoring and Coaching – The Academic Success Center (ASC) provides tutoring, academic success coaching and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, visit http://www.unlv.edu/asc or call 702-895-3177. The ASC building is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of the SSC (ASC Coaching Spot). Drop-in tutoring is located on the second floor of the Lied Library and College of Engineering TEB second floor.

UNLV Writing Center – One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-3-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 702-895-3908. The student's

Rebel ID Card, a copy of the assignment (if possible), and two copies of any writing to be reviewed are requested for the consultation. More information can be found at: http://writingcenter.unlv.edu/

Rebelmail – By policy, faculty and staff should e-mail students' Rebelmail accounts only. Rebelmail is UNLV's official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students' e-mail prefixes are listed on class rosters. The suffix is always @unlv.nevada.edu. **Emailing within WebCampus is acceptable.**

Final Examinations – The University requires that final exams given at the end of a course occur at the time and on the day specified in the final exam schedule. See the schedule at: http://www.unlv.edu/registrar/calendars.

Communication – The preferred method of communication is by email. I will only use your Rebelmail accounts for communication. **I will respond to emails within 24 hours during weekdays (i.e. Mon-Fri) and within 48 hours during the weekend (Sat-Sun).** Should you need to see me in person, please check my

Administrative Drops/Classroom Conduct – Failure to attend a course or to submit required work will result in a grade of F. The student who neglects a course is solely responsible for dropping the course or withdrawing from the university. However, an administrative drop may be initiated at the discretion of the instructor, who will record circumstances.
Students have a responsibility to conduct themselves in class, in the labs, and in the libraries in ways which do not interfere with the right of other students to learn or of instructors to teach. For further information, see Graduate Catalog. All kinds of beepers and cellular phones should be turned off during the class sections. The socialization unrelated to the topics and issues of group and class discussion need to be reduced to minimum level. Such disruptions are also considered in grading your participation grade. Students are encouraged to secure an e-mail account with UNLV and to use this to communicate with the professor and other students in the class during the semester.