PSY 3321: Intermediate Research Methods & Statistical Analysis

spring, 2018

Professor: Dr. James Forbes
Office & Office Hours: A204B Academic Building: MTWRF 8:30-9:30 am & 1 – 2 pm; or by appointment
E-mail & Phone: James.Forbes@angelo.edu; 325-486-6120
Course Web site: http://blackboard.angelo.edu/

Recommended Text & Required Software

Theresa L. White; Donald H. McBurney (2012). Research Methods, Wadsworth.


IBM SPSS Statistics Software. This software is already downloaded on most computers in all of the campus computer labs. To access SPSS, browse all programs, then click on the IBM SPSS Statistics 21 icon. So there is no additional software for you to purchase.

Course Description & Goals

Don’t panic! (Douglas Adams, The Hitchhikers’ Guide to the Galaxy)

This course is designed as the second half of a two-semester research methods and statistics course sequence. The half-life for knowledge of statistics especially, and to a lesser extent, research methods, is notoriously short. So don’t worry if you cannot remember much statistics and research methods from your previous course. We’ll begin the semester with an introduction to SPSS statistical analysis software. The statistics portion of the course will focus on comparisons of means using t-tests, analysis of variance (ANOVA), multiple linear regression, and correlation. Throughout the semester, different research methods will be introduced along with explanations of statistical techniques typically used to analyze the resulting data.

The purpose of the course is to prepare you to design empirical research, analyze data using SPSS for Windows statistical software, and communicate the results of data analysis. Ideally, the
course will help you become a more skilled critical evaluator of social science research. The course will also prepare you for the seminar in psychological research by helping you develop skills necessary to conduct and disseminate your own research.

**Student Learning Outcomes**

You will learn how to:

1. apply a variety of research methods to address empirical questions,
2. conduct statistical analyses on a computer using SPSS for Windows,
3. use quantitative reasoning to interpret the SPSS analysis output file for each statistical analyses,
4. write an APA style results section for all of the statistical analyses that you conduct.

A serendipitous benefit of learning about research methods and statistical analysis is that it will help overcome the normal human mental short-cuts and slip-ups in thinking.

"If you want to make an easy job seem mighty hard, just keep putting off doing it." ~Olin Miller

**Methods of Assessing Learning Outcomes**

**Assignments (35% of Course Grade).** Typically, assignments will consist of applications or research methods, data analysis using SPSS for Windows, and an APA style written report of the results. Homework assignments will be graded using a 5-point scale, where a 5 is this highest score obtainable. *Please note that assignment scoring and grading are separate processes.* Your assignment score will be the proportion of the total points you obtain. At the very end of the semester, I will sum your assignment scores, evaluate the class assignment score distribution, then assign assignment grades

*Late homework must be turned in during class on Friday. There are no exceptions to this rule. Late homework will be assessed a late penalty of 1-3 points.*

SPSS for Windows is statistical software available in the ASU computer laboratories.

**Exams (40% of Course Grade).** There will be three take home exams. Your work must be your own and you may not work with others on any of the exams. You may ask me questions about the exam and I will help you complete the problems. Exams will focus on the material immediately preceding them. So, strictly speaking, the exams are not cumulative. However, understanding statistics is cumulative; topics presented later in the course will build upon topics presented earlier in the course. If you do not actively strive to learn early topics you will not understand later topics. Therefore, I encourage you to work to keep current with the topics presented in class and to not fall behind on your homework assignments. The format of each exam will be research method and design exercises, computational problems, and written reports of analyses. Your exam grade will be determined by me after I look at the score distribution for the entire class.

Early or late exams are not given. It is also my policy not to give make-up exams except in the very infrequent case of verified (by a doctor) illness, death in the family, cataclysmic world altering event, and so on.

**Attendance, Participation, & Quizzes (25% of Course Grade).** Attendance is mandatory. Excessive class absences will result in a failing course grade.
Participation includes asking questions, completing homework assignments, active involvement in classroom activities, collaborating with other students, and refraining from boorish behavior (viz., not completing assignments before class, gaming course policy, texting, web-surfing, habitually arriving late). The benefits of taking an active part in learning research design and statistics are greater understanding of course content and a more satisfying classroom experience. Quizzes will be given during class, consist of short answer questions, multiple choice question, or exercises and cover topics I talk about in class. There are no make-up quizzes.

Cell Phone Policy. You may bring your cell phone with you to class; you may not use your cell phone during class, except for an emergency.

University Policy

GENERAL POLICIES RELATED TO THIS COURSE
All students are required to follow the policies and procedures presented in the following documents:
● Angelo State University Student Handbook located on the ASU website

Honor Code. Angelo State University expects its students to maintain complete honesty and integrity in their academic pursuits. Students are responsible for understanding the Academic Honor Code, which is available on the web at: http://www.angelo.edu/forms/pdf/honorcode5.pdf

STUDENTS WITH DISABILITIES
1. “Angelo State University is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments Act of 2008 (ADAAA), and subsequent legislation.”

2. The Office of Student Affairs is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student’s responsibility to initiate such a request by contacting the Office of Student Affairs, University Center, Room 112 at (325) 942-2047 or (325) 942-2211 (TDD/FAX) or by e-mail at studentservices@angelo.edu to begin the process. The Office of Student Affairs will establish the particular documentation requirements necessary for the various types of disabilities.

Reasonable accommodations will be made for students determined to be disabled or who have documented disabilities.

STUDENT ABSENCE FOR OBSERVANCE OF RELIGIOUS HOLY DAYS
“A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence."

Grades

Final course grades will be calculated as follows: Course Grade = Average Exam Score (40%) + Assignments Score (35%) + Attendance & Participation Score (25%).

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<tr>
<th>Letter Grade</th>
<th>Percentage Grade</th>
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January, 2018

A  90-100%
B  80-89%
C  70-79%
D  60-69%
F  0-59%

Course Schedule

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<tr>
<th>Date</th>
<th>Topic</th>
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<tr>
<td>Weeks 1-2</td>
<td>Descriptive Methods; Creating &amp; Editing an SPSS Date File</td>
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<td>Descriptive Statistics Using SPSS: Scales of Measurement,</td>
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<td>Measures of central tendency, Measures of variation</td>
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<td>Types of distributions: frequency and probability</td>
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<td>Z-scores</td>
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<td>Weeks 3-5</td>
<td>Experimental Designs: Between-participants, Correlated Groups</td>
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<td>Hypothesis Testing and Inferential Statistics Using SPSS:</td>
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<td>t Test single sample: One-Tailed, Two-Tailed</td>
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<td>t Test for independent groups</td>
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<td>t Test for correlated groups</td>
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<td><strong>Exam 1</strong></td>
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<td>Week 6</td>
<td>Experimental Designs with More Than Two Levels of an Independent Variable</td>
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<td>Between-Participants Designs</td>
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<td>Calculation of One-Way Randomized ANOVA Using SPSS</td>
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<td>Interpreting the SPSS output for One-Way ANOVA</td>
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<td>Graphing the Means</td>
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<td>Effect Size: Eta-squared ($\eta^2$)</td>
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<td>Post hoc comparisons of means: Tukey’s- Post Hoc Test; t-test and the</td>
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<td>Bonferonni adjustment of alpha</td>
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<td>Coefficient Contrasts</td>
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<td>Describing your analysis</td>
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<td>Week 7</td>
<td>Correlated-Groups Designs</td>
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<td>Calculation of One-Way Repeated Measures ANOVA Using SPSS</td>
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<td>Interpreting the SPSS output for One-Way Repeated Measures ANOVA</td>
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<td>Assumptions</td>
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<td>Graphing the Means and Effect Size</td>
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<td>Eta-squared ($\eta^2$)</td>
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<td>Paired Samples t-tests</td>
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Bonferonni adjustment

Weeks 8-11  Factorial Designs (More Than One Independent Variable)

   Main Effects and Interaction Effects
   Calculating Two-Way Between participants ANOVA Using SPSS
   Assumptions
   Post-Hoc Comparisons using T-test and Bonferroni adjustment

   Calculating Three-Way Between participants ANOVA Using SPSS
   Assumptions
   Post-Hoc Comparisons using T-test and Bonferroni adjustment

   Calculating Two-Way Mixed ANOVA Using SPSS
   Assumptions
   Post-Hoc Comparisons
   Bonferonni adjustment

Exam 2

Week 12  Surveys: Construction & Sampling Techniques

Week 13  Correlation Methods & Statistics:

   Correlation coefficient
   Magnitude
   Scatterplots
   Linear Relationships
   Positive
   Negative
   None

   Calculating and Interpreting Correlation Coefficients Using SPSS
   Person Product-Moment Correlation
   Spearman

   Misinterpreting Causality: Third-variable problem
   Restrictive Range

Weeks 14-15  Linear Regression: Prediction

   Simple Linear Regression Using SPSS
   Multiple Linear Regression Using SPSS

Nonparametric Designs

   Chi-Square ($\chi^2$) Goodness-of-Fit Test

   Calculating for ($\chi^2$) Goodness-of-Fit Test Using SPSS
   Interpreting SPSS Output
Assumptions

Chi-Square ($\chi^2$) Test of Independence

Calculating for ($\chi^2$) Test of Independence Using SPSS
Interpreting SPSS Output
Assumptions
Effect Size: Phi Coefficient ($\phi$)

Exam 3

*Please note that this schedule may vary at my discretion.*