**Intermediate Research Methods & Statistical Analysis**

(PSY 3321; Section 010)

Spring, 2017  
T & R 11:00 to 12:15  
A119

**Professor:** Dr. James Forbes  
**Office & Office Hours:** A204B Academic Building: MTWRF 10:00-11:00 am & 1 – 2 pm; or by appointment  
**E-mail & Phone:** James.Forbes@angelo.edu; 325-486-6120  
**Course Web site:** [http://blackboard.angelo.edu/](http://blackboard.angelo.edu/)

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**LEARNING OBJECTIVES/STUDENT LEARNING OUTCOMES:** 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 research methods and 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 more skilled as a critical evaluator of social science research as well as research in general which is often misreported in the popular media. The course will also prepare you for the seminar in psychological research by helping you to develop the skills necessary to conduct and disseminate your own research.

**Course Objectives:**
1. Gain factual knowledge (terminology, classifications, methods, trends)
2. Learn fundamental principles, generalizations, or theories
3. Learn to apply course material (to improve thinking, problem solving, and decisions)

**Student Learning Outcomes**
You will learn how to:

1. utilize a variety of research methods,
2. conduct statistical analyses on a computer using SPSS for Windows,
3. interpret the SPSS analysis output file for each statistical analysis,
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.

**METHODS OF ASSESSING LEARNING OUTCOMES:**

**Assignments (40% 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. Your assignment score will be the proportion of the total points you obtain. Your assignment grade will be determined by me at the end of the semester after I look at the score distribution for the entire class.

As with the exams, since you will have more than one day to complete an assignment, there will be no makeup assignments nor will late assignments be accepted.

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 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 (20% 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, 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.

**FINAL COURSE GRADE.** Final course grades will be calculated as follows: Course Grade = Average Exam Score (40%) + Assignments Score (40%) + Attendance & Participation Score (20%).

**Tentative Schedule**

*Course Schedule*
Date  
Weeks 1-2  
Topic: Descriptive Methods; Creating & Editing an SPSS Data File

Descriptive Statistics Using SPSS: Scales of Measurement, Measures of central tendency, Measures of variation

Types of distributions: frequency and probability
  Z-scores

Weeks 3-5  
Topic: Experimental Designs: Between-participants, Correlated Groups

Hypothesis Testing and Inferential Statistics Using SPSS:
  - t Test single sample: One-Tailed, Two-Tailed
  - t Test for independent groups
  - t Test for correlated groups

Exam 1

Week 6  
Topic: Experimental Designs with More Than Two Levels of an Independent Variable

Between-Participants Designs
  - Calculation of One-Way Randomized ANOVA Using SPSS
  - Interpreting the SPSS output for One-Way ANOVA
  - Graphing the Means
  - Effect Size: Eta-squared ($\eta^2$)
  - Post hoc comparisons of means: Tukey’s- Post Hoc Test; t-test and the Bonferonni adjustment of alpha
  - Coefficient Contrasts
  - Describing your analysis

Week 7  
Topic: Correlated-Groups Designs

  - Calculation of One-Way Repeated Measures ANOVA Using SPSS
  - Interpreting the SPSS output for One-Way Repeated Measures ANOVA
  - Assumptions
  - Graphing the Means and Effect Size
    - Eta-squared ($\eta^2$)
  - Paired Samples t-tests
  - Bonferonni adjustment

Weeks 8-11  
Topic: 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
Bonferroni 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
* Syllabus is subject to change at the discretion of the instructor*

**ACADEMIC INTEGRITY:** 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 [angelo.edu/forms/pdf/honorcode5.pdf](https://angelo.edu/forms/pdf/honorcode5.pdf). Violations of academic honesty may result in course failure.
**ATTENDANCE:** Students are expected to attend each class and attendance will be taken each day (as long as I remember to bring the attendance sheet). It is the **student’s responsibility** to see that they sign the attendance sheet. Attendance may influence final course grades such that students with perfect attendance and a borderline grade (e.g., 79.5%) may be assigned the higher grade. Students are responsible for all material/information provided during a missed class period. Learning statistics is of a cumulative nature, later topics will build upon previous topics; do not fall behind. If you ignore early topics you will never master the subsequent ones.

Experience has shown that students who consistently attend class perform significantly better than those who do not.

**EXTRA CREDIT:** Opportunities for earning extra points may be available during the semester. No more than 3 credits (15 extra points or 5 points per credit) may be accumulated. To access available research opportunities and earn extra credit, students must create an account on the web at [http://angelostate.sona-systems.com](http://angelostate.sona-systems.com) (see the section entitled “Research Opportunities” on the Department webpage for instructions).

**NOTE:** This can be a difficult and frustrating course for some individuals. Should any aspect of lecture or class discussion cause a student personal discomfort, please advise the instructor.

**Students with Disabilities:** Persons with disabilities which warrant academic accommodations must contact the Student Life Office, Room 112 University Center (325-942-2191), in order to request such accommodations prior to their being implemented. You are encouraged to make this request early in the semester so that appropriate arrangements can be made.

**Final Note:**
To ensure a high quality learning environment, please turn off all cell phones prior to the start of class and exams. I reserve the right to ask a student to leave class if his or her behavior is interfering with the learning process of other students. Examples of behaviors that are disruptive include but are not limited to

- Tardiness is not accepted, especially for exams. Please do not disrupt the lecture/exam by coming in late.
- Talking during lectures. I will not talk over you and may ask you to leave the class if you persist in talking during a lecture.
- Listening to music or watching videos during a lecture. Even if I don’t notice this behavior it is disruptive to your fellow students.
- If there are perpetual disruptions by students I will create seating assignments that minimize disruptions.