Intermediate Research Methods & Statistical Analysis

(PSY 3321; Section 010)

Fall, 2018  T & R 1:00 to 2:15  A033

Instructor:  Steven T. Brewer, Ph.D.
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Phone:  (325) 486-6124
Office Hours:  M & W:  1:00 – 3:00
              T:  2:15 – 3:15
              R:  10:00 – 1:00
              F:  10:00 – 12:00 (virtual);
                  Or by appointment.

Top Hat

We will be using the Top Hat (www.tophat.com) classroom response system this semester. You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message. Additionally, we will be using the custom-built interactive textbooks “Research Methods in Psychological Science” and “Statistics for Social Sciences” for this course. Don’t panic about having two textbooks worth of material! We will be selectively using information from both books.

If you haven’t started already, you can visit the Top Hat Overview (https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide) within the Top Hat Success Center which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system.

An email invitation has been sent to you by email, but if didn’t receive this email for some reason, you can register by simply visiting our Top Hat course website: https://app.tophat.com/e/203055

Note: our Course Join Code is 203055

Top Hat may require a paid subscription, and a full breakdown of all subscription options available can be found here: www.tophat.com/pricing.

Don’t worry if you don’t see any content in the course right away, I will make it available to you as we progress through the semester.

Should you require assistance with Top Hat at any time, due to the fact that they require specific user information to troubleshoot these issues, please contact their Support Team directly by way of email (support@tophat.com), the in app support button, or by calling 1-888-663-5491.
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:

Exams. There will be four take home exams. 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 questions regarding conclusions of the computational problems and questions (multiple choice/short answer) concerning research design. Each exam will be worth 100 points.

Exams will be take home (with the exception of the first exam). You will have more than just a class period to complete each exam and as a result I will not allow makeup exams except under the most extraordinary circumstances (as determined by me).

Homework Assignments. Typically, early assignments will involve research design, independent variables, operational definitions, confounds, validity, etc. while later assignments will consist of a data
analysis using SPSS for Windows, and a written report of the results. Homework assignments be worth 5 pts each. 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.

**FINAL COURSE GRADE.** Your final grade will be based on a certain percentage of the total possible points: A = 90-100%, B = 80-89.9%, C = 70-79.9%, D = 60-69%, F = below 60%.

## Tentative Schedule*

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<tr>
<th>Date</th>
<th>Topic</th>
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<tr>
<td>Weeks 1-2</td>
<td>What are you curious about? What events, behaviors, activities, inexplicable actions have made you wonder ... why? <em>(Chapters 1, 2, &amp; 3)</em> Variables. Descriptive Methods <em>(Chapter 14)</em>. Operational definitions <em>(Chapter 2)</em>. Introduction to SPSS (SPSS for Windows is statistical software available in the ASU computer laboratories. SPSS is also available for temporary rental online and downloadable to your personal computer).</td>
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<td>Descriptive Statistics Using SPSS: Scales of Measurement, Measures of central tendency, Measures of variation <em>(Chapter 14)</em>. Types of distributions: frequency and probability, z-scores <em>(Chapter 15)</em>.</td>
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<td>Weeks 3-5 Experimental Designs: Between-participants, Correlated Groups, Confounds. Randomized and quasi-experimental designs (manipulated vs. non-manipulated independent variable) <em>(Chapters 9, 10, 13)</em>.</td>
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<td>Exam 1 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 <em>(Chapter 15)</em>.</td>
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<td>Exam 2 Experimental Designs with More Than Two Levels of an Independent Variable Between-Participants Designs Calculation of One-Way Randomized ANOVA Using SPSS <em>(Chapter 11)</em> 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</td>
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| Week 7 | Correlated-Groups Designs *(Chapter 10, 11)*  
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 (η²)  
Paired Samples t-tests  
Bonferroni adjustment |
|---|---|
| Weeks 8-11 | Factorial Designs (More Than One Independent Variable) *(Jackson 11)*  
Main Effects and Interaction Effects  
Calculating Two-Way Between participants ANOVA Using SPSS  
Assumptions  
Post-Hoc Comparisons using T-test and Bonferroni adjustment  
Assumptions  
Post-Hoc Comparisons using T-test and Bonferroni adjustment  
Calculating Two-Way Mixed ANOVA Using SPSS  
Assumptions  
Post-Hoc Comparisons  
Bonferroni adjustment |
| **Exam 3** | |
| Week 12 | Surveys: Construction & Sampling Techniques. Transforming, creating, recoding variables in SPSS. *(Chapter 8)* |
| 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

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<th>Weeks 14-15</th>
<th>Linear Regression: Prediction</th>
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<td>Simple Linear Regression Using SPSS</td>
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<td>Multiple Linear Regression Using SPSS</td>
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<td>Nonparametric Designs</td>
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<td>Chi-Square (χ²) Goodness-of-Fit Test</td>
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<td>Calculating for (χ²) Goodness-of-Fit Test Using SPSS</td>
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<td>Interpreting SPSS Output</td>
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<td>Assumptions</td>
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<td>Chi-Square (χ²) Test of Independence</td>
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<td>Calculating for (χ²) Test of Independence Using SPSS</td>
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<td>Interpreting SPSS Output</td>
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<td>Assumptions</td>
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<td>Effect Size: Phi Coefficient (φ)</td>
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* Exam 4 (due by 3:00 p.m. Tuesday 12-11-2018)*

*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. 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 (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.