Course: SOWO 911, Introduction to Social Statistics and Data Analysis
Fall 2010, Thursday 9:00 – 11:50 A.M., Room 226

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Office Hours: Before and after class and by appointment

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Course Description and Objectives: This course is designed to explore basic statistical concepts related to the behavioral sciences and to provide instruction in the following topics: basic data analysis; construction and analysis of data tables; graphical analysis of data; knowledge and application of descriptive and inferential statistics; and knowledge and application of statistical software programs to analyze data. Upon completion of this course, students will be able to:

1. Use a computing software package to create and analyze data relevant to social behavioral research;
2. Understand a normal distribution, and apply it to inference of a population mean by conducting univariate z test and t test;
3. Know how to develop and test alternative and null research hypotheses and understand Type I and II errors, and understand factors affecting statistical power;
4. Understand the central limit theorem and other sampling theories and the application of this knowledge to assessing strengths and limitations of probability and nonprobability sampling strategies;
5. Understand the chi-square distribution and apply it to the analysis of contingency tables involving two or more categorical variables;
6. Understand correlation and apply it to the evaluation of associations between continuous variables;
7. Know how to perform independent samples t test, paired t test, one-way between-subject analysis of variance (ANOVA), one-way within-subject ANOVA, and two-factor ANOVA;
8. Know how to interpret results of statistical analysis and clearly and effectively communicate findings;
9. Have general knowledge about non-normal distributions (Bernoulli, binomial, exponential and exponential family, and multinomial) in preparation for advanced statistics courses; and

Required Course Materials:

Supplemental Course Materials:

Students are encouraged to use and bring calculators for class and exam sessions.
Policy on Incomplete or Late Assignments: Students must notify the instructor at least 24 hours before an assignment is due if an assignment is going to be turned in late. Extensions may be given at the instructor’s discretion. Students will lose five points for each 24-hour period beyond the due date and time (including weekends) for unexcused late assignments. Assignments that are more than 5 days late will not be accepted. A grade of “Incomplete” will be given only in extenuating circumstances and in accordance with School of Social Work and University policy.

Policy on Academic Dishonesty: Academic dishonesty is contrary to the ethics of the social work profession, is unfair to other students and will not be tolerated in any form. Please refer to the APA Style Guide, The SSW Manual, and the SSW Writing Guide for information on attribution of quotes, plagiarism and appropriate use of assistance in preparing assignments. All written assignments should contain a signed pledge from you stating that, "I have not given or received unauthorized aid in preparing this written work." In keeping with the UNC Honor Code, if reason exists to believe that academic dishonesty has occurred, a referral will be made to the Office of the Student Attorney General for investigation and further action as required.

Format for Written Work: APA format should be used for all written assignments. Students should refer to the Publication Manual of the American Psychological Association (6th ed.) for information on APA format. A self-paced APA tutorial can be found at http://www.lib.unc.edu/instruct/citations/apa/index.html.

Policy on Accommodations for Students with Disabilities: Students with disabilities that affect their participation in the course and who wish to have special accommodations should contact the University’s Disabilities Services (Voice/TDD 962-8300, 966-4041). Students should discuss the specific accommodations (e.g. changes in instructional format, examination format) with their instructor.

Course Requirements

Quizzes: Each week at the beginning of class a short quiz covering material from the previous week will be given. Each quiz will be discussed after its completion and returned after grades are recorded. Quiz grades will be averaged and this final quiz grade will count for 25% of the total grade. These quizzes will provide ongoing feedback concerning knowledge acquisition and will provide the information necessary to take corrective measures, by both the professor and students, to ensure that adequate learning has occurred.

Homework: There will be eight homework assignments during the course of the semester. These assignments are structured to reinforce classroom learning and help students develop and further critical thinking and data analytic skills. Homework assignments will count for 25% of the total course grade.

Midterm and Final Exams: The midterm and final exams will be worth 25% each. The final exam will not be cumulative. Exams will consist of true/false, multiple choice, short answer, and essay questions. These exams will make up 50% of the total grade.

Evaluation and Grading:

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<td>Quizzes</td>
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<td>Homework</td>
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<td>Midterm Exam</td>
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<td>Final Exam</td>
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Course Outline and Readings

August 26
Introductions
Course overview and syllabus
Review of basic research concepts

September 2
Quiz 1
Frequency distributions
Measures of central tendency and variability
Crosstabulation, mean differences, scatterplots
Lab session: Descriptive statistics and distributions

Required readings:
Kiess & Green: Ch. 2, Statistics in the Context of Scientific Research
Kiess & Green: Ch. 3, Looking at Data: Frequency Distributions and Graphs
Kiess & Green: Ch. 4, Looking at Data: Measures of Central Tendency
Kiess & Green: Ch. 5, Looking at Data: Measures of Variability

Recommended readings:
Kiess & Green: Ch. 1, Making Sense of Variability: An Introduction to Statistics
Kiess & Green: APPENDIX A: Mathematics Review

September 9
Quiz 2
Homework assignment #1 due
Principles of estimation and inferential statistics
Lab session: Data management

Required readings:
Kiess & Green: Ch. 6, Normal Distribution, Probability and Standard Scores
Keiss & Green: Ch. 7, Understanding Data: Using Statistics for Inference and Estimation

Recommended readings:
Acock: Ch. 1 - 5 (read these chapters over the next several weeks of the course)

September 16
Quiz 3
Homework assignment #2 due
Testing hypotheses about mean differences between independent and dependent groups

Required readings:
Kiess & Green: Ch. 8, Introduction to Statistical Hypothesis Testing
Kiess & Green: Ch. 9, The Basics of Experimentation and Testing

September 23
Quiz 4
Homework assignment #3 due
Testing hypotheses about means (cont’d)
Lab session: T tests

Review:
Keiss & Green: Ch. 7, Understanding Data: Using Statistics for Inference and Estimation
Kiess & Green: Ch. 8, Introduction to Statistical Hypothesis Testing
Kiess & Green: Ch. 9, The Basics of Experimentation and Testing

Recommended readings:
Acock: Ch. 7, Test for One or Two Means

September 30
Quiz 5
Homework #4 due
Review for midterm exam

October 7
Midterm exam

October 14
Testing hypotheses about three or more means (one-way ANOVA)

Required readings:
Kiess & Green: Ch. 10, One-Factor Between-Subjects and Analysis of Variance

October 21
Fall Break – No class
October 28  Quiz 6  
Testing hypotheses about three or more means (two-way ANOVA)  
**Lab session: ANOVA**

**Required readings:**  
Kiess & Green: Ch. 12, *One-Factor Within-Subjects Design and Analysis of Variance*

**Recommended readings:**  
Acock: Ch. 9, *Analysis of Variance (ANOVA)*

November 4  Quiz 7  
Homework # 5 due  
Comparing observed and expected counts  
**Lab session: Chi Square**

**Required reading:**  
Kiess & Green: Ch. 15, *Nonparametric Statistical Tests*

**Recommended reading:**  
Acock: Ch. 6, *Statistics and Graphs for Two Categorical Variables*

November 11  Quiz 8  
Homework # 6 due  
Measuring association  
**Lab session: Correlation**

**Required reading:**  
Kiess & Green: Ch. 13, *Correlation: Understanding Covariation*

**Recommended reading:**  
Acock: Ch. 8, *Bivariate Correlation and Regression*, pp. 179-192

November 18  Quiz 9  
Homework #7 due  
Statistical power analysis  
Matrix algebra  
Regression analysis

**Required reading:**  
Kiess & Green: Ch. 14, *Regression Analysis: Predicting Linear Relationships*  
Acock: Ch. 7, pp. 166-173  
Acock: Ch. 8, pp. 192-198

November 25  No Class - Thanksgiving

December 2  Quiz 10  
Homework #8 due  
Course evaluations  
Review for final exam

December 13  Final Exam