THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

SCHOOL OF SOCIAL WORK

Course Number: SOWO 911
Course Title: Introduction to Social Statistics and Data Analysis
Semester and Year: Fall 2018
Course Website: http://sakai.unc.edu
Time and Location: Thursdays 9:00 am – 11:50 am, TTK Room 102
Instructor: David Ansong, PhD, MSW
School of Social Work
TTK Building, Rm. 402C
Phone: 919-843-7510
Email: ansong@email.unc.edu

Teaching Assistant: Gerard Chung, MSW, PhD Student
School of Social Work
Email: gcsk1982@live.unc.edu

Office Hours: Instructor: Wednesday 10 – 11 am and by appointment
Teaching assistant: By appointment

Course Description and Objectives: This course is designed to explore basic statistical concepts related to the behavioral sciences and to provide instruction on 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-tests and t-tests;
3. Know how to develop and test alternative and null research hypotheses, 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, and
9. Have general knowledge about non-normal distributions (Bernoulli, binomial, exponential and exponential family, and multinomial) in preparation for advanced statistics courses.

Required Course Books:

Recommended Course Books:

Supplemental Course Materials:
1. Stata YouTube Channel: https://www.youtube.com/user/statacorp
2. UCLA Institute for Digital Research and Education: https://stats.idre.ucla.edu/stata/

Teaching Methods: The contributions of all students are central to the success of the class. Class sessions will consist of a mix of lectures, discussions, student presentations, and data analysis labs. Students are responsible for reading all assigned materials before the class date for which the readings are assigned.

Policy on Incomplete or Late Assignments: Written assignments are to be handed to the instructor by 9 am on the day they are due. 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. If permission for late submission is not granted before breaking a deadline, the grade will automatically be reduced by 10%, and another 10% reduction will occur each 24-hour period, including weekends. A course grade of Incomplete will be given only in extenuating circumstances and in accordance with the School of Social Work (SSW) and University policy. It is the student’s responsibility to initiate a conversation with the instructor to request an Incomplete.

Please note that technical difficulties are not an acceptable excuse for turning in an assignment late. All technical inquiries should be directed to the staff of the SSW Computing Information and Technology Unit (CITU). Please contact Phil Kaufman at philk@email.unc.edu or 919-962-6416.

Policy on Attendance: Attendance at all class sessions is expected; it is important to be on time so as not to disrupt class or miss the in-class quiz. We will cover a large amount of information in each class. If you are not able to attend a class, let the instructor know as soon as possible. It is your responsibility to obtain handouts, information about class content, and information about announcements, etc., from your classmates if you are unable to attend a class. Students with more than two absences, or those who are late to more than four classes, will receive an “L” unless they have made prior arrangements with the instructor.
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.

Policy on the Use of Electronic Devices in the Classroom: Students may use laptops for activities related to classroom learning, such as note taking. However, use of electronic devices (e.g., laptops, cell phones) for non-class related activities (e.g., checking email, playing games) is prohibited. The use of a laptop is also prohibited during quizzes. Please set your cell phones to silent or vibrate.

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. The following websites also provide additional information:


Policy on Accommodations for Students with Disabilities: To obtain disability-related academic accommodations, students with disabilities must contact the instructor and the University’s Department of Disability Services as soon as possible. Students may reach the Department of Disability Services at 919-962-8300 (http://disabilityservices.unc.edu/). Pursuant to UNC policy, instructors are not permitted to give accommodations without the permission and direction of the Department of Disability Services. Students must obtain such permission in advance of the due date for the first assignment.

Course Requirements:

1. Quizzes (20%): Eleven class sessions will begin with a short quiz on the assigned readings and course materials covered in previous sessions. This is how attendance and participation are graded for this course. Thus they cannot be made up at a later time. Each student’s top 10 scores will be averaged, and the final quiz grade will count for 20% of the total course grade.

2. Peer review of research paper ideas (5%): Students will present a plan for their research paper for peer feedback. The instructor will provide a template for the assignment. Students will have 15 minutes each for the oral presentations.

3. Homework (25%): There will be seven homework assignments during the semester. These assignments are structured to reinforce classroom learning and help students develop further critical thinking and data analysis skills. Homework grades will be averaged, and the final homework grade will count for 25% of the total course grade.

4. Research Paper (30%): Students will use datasets provided by the instructor or their own datasets to write a research paper (no more than 10 pages, double-spaced) using the univariate and bivariate statistical approaches discussed in the course. The paper should include all the main parts contained in a typical research article: (1) Title, (2) Introduction, (3) Methods, (4)
Results, (5) Discussion, and (6) References. The instructor will provide a detailed guide for the assignment.

5. **Final Exam (20%):** The final exam will be worth 20% each, and will consist of true/false, multiple choice, short answer, and essay questions. The exams are closed book, closed notes.

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<tr>
<th>Major Tasks</th>
<th>Due Date(s)</th>
<th>% of Total</th>
<th>Grading Scale:</th>
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<tbody>
<tr>
<td>Quizzes</td>
<td>Weekly</td>
<td>20%</td>
<td>94 – 100</td>
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<tr>
<td>Peer review</td>
<td>Class 7</td>
<td>5%</td>
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<tr>
<td>Homework assignments</td>
<td>Class 3, 4, 6, &amp; 8 - 11</td>
<td>25%</td>
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<tr>
<td>Final exam</td>
<td>Class 14</td>
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<tr>
<td>Research Paper</td>
<td>Class 13</td>
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**Course Outline, Readings, and Assignment Due Dates**

**Class 1**  
**August 23**  
**Topics:**
- Introductions
- Course overview and syllabus
- Review of basic research concepts
- Overview of statistical reasoning and paradigms: Bayesian versus frequentist

**Required Readings:**
- Kiess & Green: Ch. 2, Statistics in the Context of Scientific Research
- Acock: Ch. 1 - 5 (read these chapters over the next 3 weeks of the course)

**Recommended Readings:**
- Gordon: Ch. 2, *Planning a Quantitative Research Project With Existing Data*.

**Class 2**  
**August 30**  
**Topics:**
- Frequency distributions
- Measures of central tendency and variability
- Crosstabulation, mean differences, scatter plots
- Lab session: Descriptive statistics

**Required Readings:**
- 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:**
- Gordon; Ch. 5, *Basic Descriptive Statistics*
- Kiess & Green: Ch. 1, *Making Sense of Variability: An Introduction to Statistics*
- Kiess & Green: APPENDIX A: Mathematics Review

**Assignment Due:**
- In-class quiz 1

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**Class 3**

**September 6 Topics:**
- Principles of estimation
- Principles of inferential statistics

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

**Recommended Readings:**
- Gordon; Ch. 6, *Sampling, Population, and Sampling Distributions*.

**Assignments Due:**
- In-class quiz 2
- Homework 1

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**Class 4**

**September 13 Topics:**
- Testing hypotheses (Mean Differences – I)
- Lab session: Data management

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

**Recommended Readings:**
- Gordon; Ch. 7.2, *One Categorical and One Interval Variable* (pp. 203-213)
- Revisit Acock: Ch. 3 - 5

**Assignments Due:**
- In-class quiz 3
- Homework 2

**Class 5**

**September 20**

**Topics:**
- Testing hypotheses (Mean Differences – II)
- Lab session: T-tests

**Required Readings: Review…**
- Kiess & 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
- Acock: Ch. 7, Test for One or Two Means

**Recommended Readings:**

**Assignments Due:**
- In-class quiz 4

**Class 6**

**September 27**

**Topics:**
- Testing hypotheses about three or more means (One-Way Between-Subjects ANOVA)
- Lab session: One-Way Between-Subjects ANOVA

**Required Readings:**
- Kiess & Green: Ch. 10, One-Factor Between-Subjects and Analysis of Variance
- Acock: Ch. 9, Analysis of Variance (ANOVA)
Recommended Readings:

Assignments Due:
- In-class quiz 5
- Homework 3

Class 7
October 4
Topics:
- Testing hypotheses about three or more means (One-Way Within Subjects ANOVA)
- Lab session: One-Way Within-Subjects ANOVA

Required Readings:
- Kiess & Green: Ch. 12, One-Factor Within-Subjects Design and Analysis of Variance
- Acock: Ch. 9, Analysis of Variance (ANOVA)

Recommended Readings:

Assignments Due:
- In-class quiz 6

Class 8
October 11
Topics:
- Midterm review (Central tendency & variability, hypothesis testing, data distribution, z-test, t-test, ANOVA)
- Peer review of research plan

Assignments Due:
- In-class quiz 7
- Homework 4

October 18
Fall Break – No class
Class 9

October 25  
Topics:  
- Comparing observed and expected counts  
- Lab session: Chi-square

Required Readings:
- Kiess & Green: Ch. 15, Nonparametric Statistical Tests  
- Acock: Ch. 6, Statistics and Graphs for Two Categorical Variables

Recommended Readings:
- Gordon; Ch. 7.3, *Two Categorical Variables* (pp. 214-221)  

Assignments Due:  
- In-class quiz 8  
- Homework 5

Class 10

November 1  
Topics:  
- Measuring association  
- Lab session: Correlation

Required Readings:
- Kiess & Green: Ch. 13, Correlation: Understanding Covariation  
- Acock: Ch. 8, Bivariate Correlation and Regression, pp. 183-196

Recommended Readings:
- Gordon; Ch. 7.4, *Two Interval Variables* (pp. 222-273)  

Assignments Due:  
- In-class quiz 9  
- Homework 6

Class 11

November 8  
Topics:  
- All-day data lab session  
- Consultation on research paper

Assignments Due:  
- In-class quiz 10  
- Homework 7
Class 12  
November 15  Topic:
- Power analysis
- Data management

Required Readings:

Recommended Readings:

Assignments Due:
- In-class quiz 11

November 22  No Class – Thanksgiving Break

Class 13  
November 29  Topics:
- End-of-semester review (One-Way Within-Subjects ANOVA, Correlation, Chi-Square)

Assignment Due:
- Research paper

Class 14  
December 6  
- Final exam
- Course evaluation