COURSE NUMBER: SOWO 918
TITLE: Applied Regression Analysis and Generalized Linear Models, Spring 2018

INSTRUCTOR: Kirsten Kainz, Ph.D.
School of Social Work
TTK Building, Rm. 548 L
Phone: (919) 962-8826
Email: kirsten.kainz@unc.edu

OFFICE HOURS: Anytime by appointment

COURSE DESCRIPTION: This PhD-level course introduces statistical frameworks, analytical tools, and social behavioral applications of OLS regression models, logistic regression models, and generalized linear models.

COURSE OBJECTIVES: Upon completion of the course, students are expected to be able to:

- Understand the type and nature of research questions and data that are suitable for regression analysis;
- Use Stata computing software package to manage and analyze data with the OLS regression model;
- Understand the Gauss-Markov theorem and the BLUE property of OLS, especially conditions under which BLUE does not hold;
- Have a solid understanding of the five assumptions embedded in the OLS regression;
- Know how to conduct statistical tests detecting violations of OLS assumptions (i.e., multicollinearity, heteroskedasticity, influential data and outliers, etc.);
- Know how to take remedial measures if harmful violations exist (i.e., weighted least-squares regression, etc.);
- Understand the type and nature of research questions and data that are suitable for the generalized linear models;
- Have a solid understanding of basic concepts of categorical data (i.e., odds ratio, relative risk, marginal probability, and conditional probability);
- Use Stata computing software package to manage and analyze data with the binary, ordered, and multinomial logistic regressions;
- Know how to interpret results of regression analysis and logistic regression analysis, and communicate findings to general audiences clearly and effectively in writing; and
- Understand limitations of the regression and logistic regression models.

STATISTICAL SOFTWARE PACKAGE: This course will use Stata. Example code will be provided.

REQUIRED TEXTS/READINGS:


All required journal articles are available on the course Sakai site.
POLICIES

Policy on Attendance
Class attendance will be important for content and skill learning as individuals and as small groups. Do your best to attend all class sessions.

Policy on Late and Incomplete Assignments
Assignments/quizzes are to be completed/turned in to the professor on the due date noted in the course outline. In most cases, late assignments will not be accepted. In the case of an emergency, extensions may be granted by the professor, but when possible students should contact the professor before the due date to determine if their case is an emergency. Late assignments will be reduced 10 percent for each day late (including weekend days). A grade of incomplete will be given only under extenuating circumstances and in accordance with University policy.

Bad Weather Policy
In the case of snow, ice, or other threatening or unsafe conditions, students should follow UNC’s Adverse Weather announcements at www.unc.edu or Adverse Weather and Emergency Phone Line (919) 843-1234. If you have any questions or concerns, please contact UNC Public Safety at 919-962-3951 (M-F, 7:30-5:00) or after business hours at 919-962-8100.

Note about Technology
You will need a laptop to conduct analysis and other explorations in class. Please refrain from checking your email, social media sites, and other non-class related electronic destinations.

Grading System
The standard School of Social Work’s interpretation of grades and numerical scores will be used.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>94-100</td>
</tr>
<tr>
<td>P</td>
<td>80-93</td>
</tr>
<tr>
<td>L</td>
<td>70-79</td>
</tr>
<tr>
<td>F</td>
<td>69 and below</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Task</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz #1</td>
<td>20</td>
</tr>
<tr>
<td>Quiz #2</td>
<td>20</td>
</tr>
<tr>
<td>Quiz #3</td>
<td>20</td>
</tr>
<tr>
<td>Quiz #4</td>
<td>20</td>
</tr>
<tr>
<td>Final Project</td>
<td>20</td>
</tr>
<tr>
<td>TOTAL POINTS</td>
<td>100</td>
</tr>
</tbody>
</table>

ASSIGNMENTS

In Class Quizzes: Students will complete open-book/notes quizzes during class time.
Final Project

Students will complete a regression analysis – either linear with interaction term or logistic/multinominal - and write-up the results following the format used for paper submissions to the Society for Social Work and Research (SSWR) 2018 Conference.

Abstracts (500 words or less) should be submitted in a structured format and include the following:

- **Background and Purpose**: description of the problem, study objectives, research question(s) and/or hypothesis (es).
- **Methods**: study design, including a description of participants and sampling methods, data collection procedures, measures, and **appropriate analytic/statistical approach**.
- **Results**: specific results in summary form.
- **Conclusions and Implications**: description of the main outcome(s) of the study and implications for practice, policy, or further research.

Unlike the SSWR instructions, **please do** include APA formatted tables and a reference list with your submission. Tables and references will not count toward the 500 word limit. Students will have 10 minutes to present their work during the final class session.

**COURSE FORMAT & OUTLINE**

**Format**

This course combines lectures, discussions, explorations, and analytic practice to support mastery and application of material.

At the end of this course students should be able to:

1. carefully interpret published regression results;
2. describe the assumptions, purposes, and limitations of regression;
3. conduct and report linear regression analysis, including regression models with interaction terms; and
4. conduct and report categorical regression analysis models.

There is no assigned homework for this course, but students are expected to complete assigned readings and practice analysis techniques outside of class time. **The expectation is that each week students will practice the code presented on a Wednesday, master it, and come with any questions they may have the following Wednesday.**

**Outline**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/10</td>
<td>Covariance, Correlation, Regression</td>
<td></td>
<td>Introductions and Review of Syllabus</td>
</tr>
<tr>
<td>1/17</td>
<td>Multiple Regression</td>
<td>Allison, Chapters 1, 2, 5</td>
<td>Analytic Demonstration: Bivariate &amp; Multiple Regression</td>
</tr>
<tr>
<td>Date</td>
<td>Topic</td>
<td>Reading</td>
<td>Analytic Demonstration</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
<td>------------------------</td>
</tr>
<tr>
<td>1/24</td>
<td>Regression Assumptions</td>
<td>Allison, Chapters 3, 6, 7, 8</td>
<td>Multiple Regression &amp; Diagnostics</td>
</tr>
<tr>
<td>1/31</td>
<td>In Class Quiz #1: Bivariate and Multiple Regression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/7</td>
<td>Effect Sizes and Confidence Intervals</td>
<td>Fritz, Morris, &amp; Richler, 2012</td>
<td>Multiple &amp; Hierarchical Regression with Effect Sizes</td>
</tr>
<tr>
<td>2/14</td>
<td>Interactions Part I</td>
<td>Sections 1 &amp; 2 Jaccard &amp; Turrisi, 2003</td>
<td>Multiple Regression with Interactions</td>
</tr>
<tr>
<td>2/21</td>
<td>Interactions Part II: Probing</td>
<td>Kalliaht et al., 2015 Tennant et al., 2014</td>
<td>Probing Interactions</td>
</tr>
<tr>
<td>2/28</td>
<td>In Class Quiz #2: Hierarchical Regression and Interactions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/7</td>
<td>Moderation and Mediation</td>
<td>Baron &amp; Kenny, 1986 Hayes &amp; Rockwood, 2016</td>
<td>Guest Lecture: LB Klein</td>
</tr>
<tr>
<td>3/14</td>
<td>SPRING BREAK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/21</td>
<td>In Class Quiz #3: Review of Linear Regression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/11</td>
<td>In Class Quiz #4: Logistic and Categorical Regression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/18</td>
<td>Reporting Regression</td>
<td>UCLA &amp; Reporting websites</td>
<td>Reporting, Reading, &amp; Interpreting Regression Models</td>
</tr>
<tr>
<td>4/25</td>
<td>FINAL Project Presentations Write-Up Due in Class</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
References


Moderation/Mediation Websites:

http://davidakenny.net/cm/moderation.htm

http://davidakenny.net/cm/mediate.htm

http://www.quantpsy.org/interact/mlr2.htm

Reporting Websites:

https://www.apa.org/pubs/authors/jars.pdf

http://www.aera.net/Portals/38/docs/12ERv35n6_Standard4Report%20.pdf
Accessibility and Resources Services:
The University of North Carolina – Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability or pregnancy complications resulting in difficulties with accessing learning opportunities. All accommodations are coordinated through the Accessibility Resources and Service Office. In the first instance please visit their website http://accessibility.unc.edu, Tel:- 919-962-8300 or Email:- accessibility@unc.edu. A student is welcome to initiate the registration process at any time, however, the process can take time. ARS is particularly busy in the run-up to Finals and during Finals. Students submitting Self-ID forms at that time are unlikely to have accommodations set until the following semester. Please contact ARS as early in the semester as possible.

Writing Support
Clear, cogent writing is an essential skill for social work professionals. Writing support is available to all students through the School’s Writing Support Team; they can help you strengthen your writing skills by sharing strategies for organizing information, presenting a cohesive argument, ensuring clear communication, and mastering APA style. Writing Support offers a learning opportunity for students but does not merely copy edit student papers. Writing support is available in-person, by e-mail, or by phone. E-mail a requested appointment day and time to SOWWritingsupport@gmail.com. In addition, see the Writing Resources and References page on the School’s website (under the Current Students tab: https://ssw.unc.edu/students/writing).

Honor Code
The University of North Carolina at Chapel Hill has had a student-administered honor system and judicial system for over 100 years. The system is the responsibility of students and is regulated and governed by them, but faculty share the responsibility. If you have questions about your responsibility under the honor code, please bring them to your instructor or consult with the office of the Dean of Students or the Instrument of Student Judicial Governance. This document, adopted by the Chancellor, the Faculty Council, and the Student Congress, contains all policies and procedures pertaining to the student honor system. Your full participation and observance of the honor code is expected. If you require further information on the definition of plagiarism, authorized vs. unauthorized collaboration, unauthorized materials, consequences of violations, or additional information on the Honor Code at UNC, please visit http://honor.unc.edu.

Policy on Prohibited Harassment and Discrimination
The University’s Policy on Prohibited Harassment and Discrimination (http://www.unc.edu/campus/policies/harassanddiscrim.pdf) prohibits discrimination or harassment on the basis of an individual’s race, color, gender, national original, age, religion, creed, disability, veteran’s status, sexual orientation, gender identity or gender expression. Appendix B of this Policy provides specific information for students who believe that they have been discriminated against or harassed on the basis of one or more of these protected classifications. Students who want additional information regarding the University’s process for investigating allegations of discrimination or harassment should contact the Equal Opportunity /ADA Office for assistance at 919.966.3576 or via email at equalopportunity@unc.edu or through U.S. Mail at:

Equal Opportunity/ADA Office
The University of North Carolina at Chapel Hill
100 East Franklin Street, Unit 110
Campus Box 9160
Campus Box 9160 Chapel Hill, NC 27599