



**SYLLABUS:**  
**Quantitative Data Analysis II**  
**(SOC 781)**  
**Spring Semester, 2018**  
**Meeting times: Thursdays, 4 to 6:30 p.m.**  
**Instructor: Dr. Robyn Brown**  
**Teaching Assistants: Dakota Thomas and**  
**Chenghui Zhang**

**CONTACT INFORMATION:**

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**COURSE DESCRIPTION AND OBJECTIVES:**

This is the second course in a two-semester sequence of graduate-level statistics and data analysis classes. The goal of the course is to further your understanding of multivariate data analytic techniques and introduce a broad class of models often referred to as generalized linear models (GLM).

These models are an extension of the linear regression model you have already learned applied to non-normally distributed outcomes. We will discuss four major types of GLMs within this class: models for categorical outcomes, ordered outcomes, count outcomes, and event outcomes.

Throughout the semester, we will emphasize the application of the statistical techniques we are learning (including computer applications using Stata) and the substantive interpretation of quantitative results in relation to research questions and hypotheses in the tradition of the social sciences. Upon successful completion of the course, you will gain:

1. Further proficiency in recoding variables, running basic descriptive analyses, and conducting and interpreting OLS and binary logistic regression analyses using Stata;
2. Familiarity with interaction effects, mediation effects, non-linear relationships, and assumption violations in multiple regression analyses;

3. The ability to reproduce existing GLM results from the textbook and create your own results from secondary data;
4. An aptitude for translating results into more useful summaries through tables and figures of predicted outcomes; and
5. A working knowledge of the steps to follow in preparing statistical results for professional dissemination. (*Note that the original empirical research you conduct this semester may be used to develop a conference paper and/or journal article.*)

### **REQUIRED COURSE MATERIALS:**

There are two required books for this class:

*Generalized Linear Models: An Applied Approach*, by John P. Hoffmann;  
*Regression Models for Categorical Dependent Variables Using Stata (3<sup>rd</sup> edition)*, by J. Scott Long and Jeremy Freese.

Additional **required** readings are available in the course library available through our course website.

### **DESCRIPTION OF COURSE ACTIVITIES AND ASSIGNMENTS:**

All students are expected to complete the following **three** course requirements: **(1)** Complete seven homework assignments throughout the semester; **(2)** Complete a final research paper; and **(3)** Present a 15-minute summary of your research. These requirements are described in greater detail below:

**1. Homework Assignments (total of 49% of course grade):** Seven homework assignments will be completed throughout the semester. Each assignment is worth 7% of the course grade. Most assignments include a computer application and a write-up that presents an interpretation of results in relation to the hypotheses being tested. You should never come late to class or miss a class session in order to complete an assignment.

I believe that cooperation is the basis of good learning, and I encourage you to consult with one another while working on assignments. I leave it up to your individual consciences to determine the fine line between working with one another in a cooperative manner and merely copying from one another. In other words, talk and consult with each other as much as you like but in the end each student is required do his or her own individual written work.

**2. Final research paper (40% of course grade):** Each student will write a paper that presents an original empirical piece of multivariate quantitative research based upon an analysis of available secondary data. You will use a data set of your choice to work with on this project, although I can make a few data sets available to students upon request. The paper will follow the format of a sociology journal article and will include the following sections: (a) an introduction that sets forth the research question, describes the contribution of the research, and develops substantive arguments and hypotheses, based upon theory and prior research, that you will test; (b) a description of the data, measures, and methods of multivariate analysis; (c) a presentation and interpretation of the findings; and (d) a discussion of the implications of the findings in relation to theory, prior research, and/or policy. The homework assignments completed during the

semester will provide the foundation for this paper. As with your assignments, I encourage you to consult with one another as you develop your project and analyze your data. However, each student must conduct his or her own individual piece of research, and write his or her own paper.

**3. Class presentation of your research (11% of course grade):** Each student will make a 15-minute presentation of his or her research to the class during one of the last two class sessions. This presentation will follow the format of a professional presentation at a social science conference. We will discuss specifics aspects of a good presentation in class.

Note: All written materials that are turned in must be typed (double-spaced for text!) or generated electronically and submitted electronically via our Canvas course website. This includes tables, formulas, graphs and the like. We will be discussing how to produce professional looking tables and graphs in the course. Always maintain a copy and a backup copy of your work!

### **GRADING:**

The percentage-based grading scale for this course is as follows:

A = 90-100	D = 60-69.99
B = 80-89.99	E = below 60
C = 70-79.99	

### **MID-TERM GRADES:**

Mid-term grades will be posted in myUK by the deadline established in the Academic Calendar (<http://www.uky.edu/registrar/content/academic-calendar>).

### **COURSE POLICIES:**

**1. Participation.** All students are expected to honor our meeting schedule and participate in class activities. In addition, if you must arrive to class late or leave early, please let me know ahead of time. Once you are late to class on more than three occasions, you will subsequently be counted as absent on days you are tardy. I reserve the right to downgrade your final course grade if you consistently arrive to class late or leave early.

**2. Professional Conduct.** Respectful, professional conduct is expected in this course at all times. It is likely that students will hold differing views on the subjects we analyze with secondary data this semester. You are encouraged to share your views, so long as they are presented in a respectful way. Students who do not act professionally and treat others with respect will be removed from the class and receive a failing grade.

Also, please turn off or silence your cell phone before class. Do not talk on your phone or send text messages during class. Inappropriate cell phone use will result in points being deducted from your final course grade. Note additionally that laptops are permitted only for class activities. Please do not surf the web, IM, etc. during course meetings. Inappropriate computer use will result in points being deducted from your final course grade.

**3. Attendance.** Students need to notify the professor of absences prior to class when possible. S.R. 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness,

(b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit “reasonable cause for nonattendance” by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Information regarding dates of major religious holidays may be obtained through the religious liaison, Mr. Jake Karnes (859-257-2754).

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused or unexcused), per university policy.

Note also that students may be asked to verify their absences in order for them to be considered excused. Senate Rule 5.2.4.2 states that faculty have the right to request “appropriate verification” when students claim an excused absence because of illness or death in the family. Appropriate notification of absences due to university-related trips is required prior to the absence.

**4. Late Assignments:** Unless I have given you prior permission to complete an assignment after the due date—and I will give permission to do so only in extreme circumstances—no late work will be accepted.

**5. Office Hours:** Please feel free to come by during my office hours to discuss any questions you have about the course and course assignments. If you cannot make it during my office hours, I would be happy to arrange another time when we could meet.

**6. Uphold the University’s Academic Integrity Policy.** Students are expected to uphold the Academic Integrity Policy published in the *University of Kentucky Student Handbook*. Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the university may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: <http://www.uky.edu/Ombud>. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Part II of Student Rights and Responsibilities (available online <http://www.uky.edu/StudentAffairs/Code/part2.html>) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel

unsure about the question of plagiarism involving their own work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgement of the fact, the students are guilty of plagiarism. Plagiarism includes reproducing someone else's work, whether it be a published article, chapter of a book, a paper from a friend or some file, or something similar to this. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be.

Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone. When a student's assignment involves research in outside sources of information, the student must carefully acknowledge exactly what, where and how he/she employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain (Section 6.3.1).

#### **ACCOMMODATIONS DUE TO A DISABILITY:**

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center for coordination of campus disability services available to students with disabilities.

#### **SCHEDULE OF TOPICS AND READINGS:**

The following course schedule is a general guideline that will be followed throughout the semester. Please note that the course schedule may be modified over the course of the term. Note also that you should read all assigned readings **BEFORE** class so that you are prepared to understand the lecture, ask useful questions, and participate in class activities. Given the complex and often technical nature of the material covered, there will not be time for extensive discussions every week. Being well prepared with questions and comments about the technical and applied readings will facilitate your learning and that of other class members.

#### Week 1. Overview of the Course Organization, Contents, Requirements, and Expectations (Jan. 11)

*Your to-do list this week:*

1. Read Long and Freese, Chapter 1
2. Identify dataset you will work with on course assignments (if this is not a dataset you're already working with, you'll need to download it and familiarize yourself with the codebook and other supporting documents).

Week 2. Review of Bivariate Analysis (Jan. 18)

*Your to-do list this week:*

1. Read Long and Freese, Chapter 2
2. Begin identifying predictor, outcome, and control variables in your dataset.

Week 3. SWS winter meeting; class will not formally meet this week. (Jan. 25)

*Your to-do list this week:*

1. Begin working on the first assignment.

Week 4. Basics of Multiple Regression and Regression Diagnostics (Feb. 1)

*Your to-do list this week:*

1. Read Hoffman, Chapter 1
  2. Begin working on the second assignment.
- \*First homework assignment due on Feb. 1.

Week 5. More Review of Regression Assumptions and Interaction Effects (Feb. 8)

*Your to-do list this week:*

1. Read Long and Freese, Chapter 3
2. Continue working on the second assignment.
3. Familiarize yourself with Stata resources provided by UCLA's Institute for Digital Research and Education (online here: <https://stats.idre.ucla.edu/stata/>)

Week 6. Mediation Effects (Feb. 15)

*Your to-do list this week:*

1. Read Long and Freese, Chapter 4, and reserve article: MacKinnon, Warsi & Dwyer, 1995
  2. By now, you hopefully have an understanding that you should be doing some work on the current homework assignment each week. Keep it up...
- \*Second homework assignment due on Feb. 15.

Week 7. Basics of Generalized Linear Models (Feb. 22)

*Your to-do list this week:*

1. Read Hoffman, Chapters 2 and 3
- \*Third homework assignment due on Feb. 22.

Week 8. Binary Outcomes – Logit and Probit (March 1)

*Your to-do list this week:*

1. Read Long and Freese, Chapters 5 and 6

Week 9. Ordinal Outcomes – Ordered Probit and Ordered Logit (March 8)

*Your to-do list this week:*

1. Read Hoffman, Chapter 4, and Long and Freese, Chapter 7
- \*Fourth homework assignment due March 8.

Week 10. Spring Break

*Your to-do list this week:*

1. Find time for a stress-relieving activity.

Week 11. Multinomial Logistic Regression (March 22)

*Your to-do list this week:*

1. Read Hoffman, Chapter 5, and Long and Freese, Chapter 8
- \*Fifth homework assignment due March 22.

Week 12. Count Outcomes – Poisson Regression and Negative Binomial Regression (March 29)

*Your to-do list this week:*

1. Read Hoffman, Chapter 6, and Long and Freese, Chapter 9

Week 13: Longitudinal Data Analysis: Technical and Practical Considerations (April 5)

*Your to-do list this week:*

1. Read reserve article: Liang and Zeger, 1986
- \*Sixth homework assignment due April 5.

Week 14: Event History and Survival Analysis (April 12)

1. Read Hoffman, Chapter 7

Week 15: Class Presentations (April 19)

\*Seventh homework assignment due April 19.

Week 16: Class Presentations (April 26)

\*Final course paper due by the end of the day on April 26.