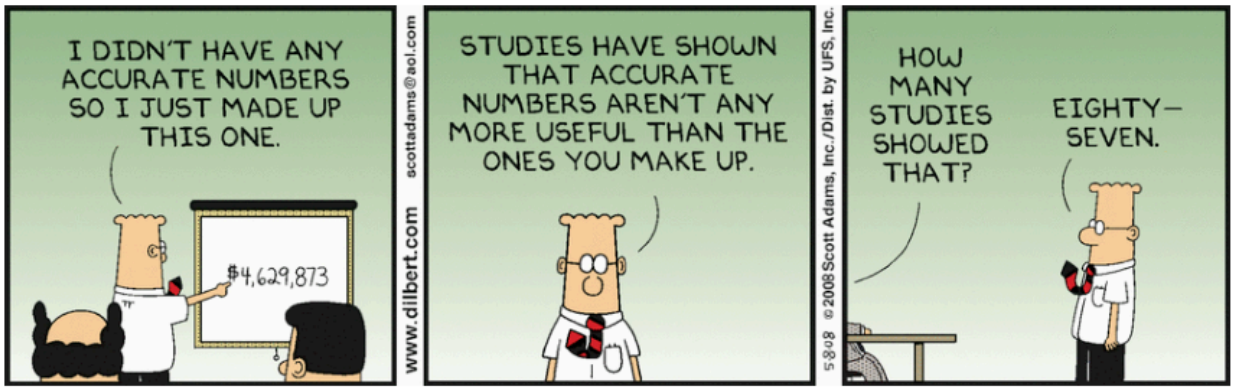
# Sociology 511
# Sociological Methods II (Graduate Statistics)
# Spring 2019

**Professor Orestes "Pat" Hastings** (pat.hastings@colostate.edu)
**Office hours:** Tue/Thu 11-12:15 and by appointment in Clark B248. Anytime my office door is open, you are welcome to stop by.

**Lecture:** Wednesday 3:30-6:20pm in Clark B252
**Course Website:** https://colostate.instructure.com/courses/78449




**Overview**
This course is designed to introduce students to statistics for sociological research. We will explore the statistical concepts and methods that sociologists most commonly use to gather and analyze quantitative evidence, including descriptive statistics, probability and sampling distributions, statistical inference and hypothesis testing, correlation, and multiple regression with continuous and categorical data. Students will use Stata (a popular and powerful computer program) to put those skills into practice, and they will apply their skills to real sociological data to gain competence and confidence in the use of these methods.

---

**Learning Goals**

- Understand the basic logic of statistics and the major concepts
- Identify the appropriate statistical methods and models given a specific type of data and research question
- Gain familiarity with a statistical software package and conduct simple statistical analyses with real data
- Interpret the results of various statistical models and discuss their relevance for testing hypotheses and evaluating competing theories.
- Build a strong foundation in order to be able to learn new statistical methods in the future and to excel in future advanced graduate-level quantitative methods courses.

---

**Prerequisites, or, What You Should Already Know**

A prerequisite for this course is an undergraduate-level statistics course. Ideally, topics covered would include descriptive statistics, measures of central tendency and variability, probability, statistical inference, correlation, and regression. Realistically, students' previous training (and retention of it) will vary widely, and we will adjust the course appropriately. An additional prerequisite is a graduate-level general research methods course. If your background in statistics and methods is not very strong, you can still do very well in this course, but you should expect to put in some extra work at the beginning. If you are unsure about your preparedness for this course, talk to me.

---

**Evaluation**

Your grade will be assigned using the standard letter +/- system based on:

- High-quality participation (15%)
- Homework assignments (24%)
- Midterm exam (20%)
- Final exam (20%)
- Research paper (21%)

*High-quality participation (20%)*

This is a small seminar. I expect you to attend and actively participate in every class. **If you don't understand something, please ask!** Please talk to me if you must miss class.

*Homework assignments (8 x 3% = 24%)*

There will be nine homework assignments. They will be some combination of "math problems" and exercises with Stata. You will typically have one week to do each assignment and they will be due at the beginning of class. I will drop your lowest score and your grade will be the sum of the best 8 assignments. Working together with other students in the class is allowed and encouraged!

*Exams (20% midterm; 20% final)*

There will be an in-class midterm and a take-home final exam focused on evaluating your understanding of the main ideas and concepts, not how well you can memorize facts. As such, you may use your textbook, notes, and computer/calculator on the exams. You may not consult other individuals (nor the internet) for the take-home.

*Research paper (21%)*

Each student will write a final paper that uses statistical methods from the course to examine one or more theoretically motivated hypotheses of your choosing. You will first write a 1-2 page single-spaced *proposal*, due April 17. The final *paper* should be about 10-12 pages double spaced (not counting tables, figures, and references), and is due by May 17. More details will be provided later in the semester.

---

**Textbook**

There is one required book:

> Agresti, Alan. 2018. *Statistical Methods for the Social Sciences* (5th edition). Pearson (ISBN: 9780134507101)

The 5th edition is expensive! Although I will teach with this version and have used this version for the syllabus course outline, it is fine if you choose to go with the 3rd or 4th edition (note these editions are authored by Agresti and Finlay). However, it will be your responsibility to make sure you are covering the right material. If it's any consolation, I plan to use the same textbook for Soc 613 next fall.

---

**Statistical Computing**

The primary software for this course will be Stata (www.stata.com). Stata is flexible, powerful, relatively user-friendly, and commonly used by social scientists. It has a large and diverse user community with many user-written commands that keep Stata continually up to data with new developments. You will need to use Stata for most assignments and for your final paper. We will be doing Stata live in class, so it's in your best interest to get a copy on your own laptop which you bring to class. A 6-month license can be acquired for as little as $45. Stata also exists on various computer labs in the department and around the campus.

---

**How Do I Learn This Stuff?**

Since this is a statistics course, it will be different from the typical sociology course. Here is some advice:

- Most of the material is cumulative, so it is **absolutely essential that you keep up with the course material**. If you find yourself falling behind, ask for help!
- Being good at statistics requires thinking through how to solve problems. Statistics cannot be learned simply by reading a book or listening to a lecture. You should not expect to really understand the material until after you have completed the relevant assignments.
- Learning to do statistics and use statistical software is in many ways like learning a language:
    - First, it is important not to be intimidated by new terms or the use of letters (Greek letters, even!) to represent quantities or concepts. It is often helpful to write in plain language the meaning of the quantities or concepts represented by a letter or symbol.
    - Second, the best way to learn is to practice, over, and, over. This is why the assignments are a critical part of the course. **You should feel like you have mastered the homework assignments, not simply completed them. You are strongly encouraged to do homework assignments with others.**
        - If the assignments aren't enough for you, also note that the textbook includes answers to many odd-numbered questions. If you feel that you do not adequately understand some part of the material, these may help you to work through it.
- Become extremely familiar with the readings, and reference them as you review your notes and as you work on the homework assignments. I strongly recommend either reading the relevant chapters right before or right after lecture (depending on what works best for you). Also remember the exams are open book!
- Please ask questions if you do not understand something. If it is unclear to you, it is probably unclear to other students as well. If it doesn't make sense in lecture, it will probably not make sense later when you are staring at your notes.

---

**Other Important Matters**

*In-Class Decorum*

Please come to class on time and be ready to engage the material we are covering in class. Laptops should ONLY be used for class purposes in class. Cell phones are not to be used during class. Colorado State University has stated five Principles of the Community: inclusion, integrity, respect, service and social justice (http://diversity.colostate.edu/principles-of-community/ ). Your conduct in this class should adhere to these to help us generate an open, tolerant, and respectful learning environment that we can all flourish in.

*Office hours*

I encourage you to take advantage of my office hours. I am happy to discuss course material, the assignments, your research interests, or anything else that would be useful to you. Email me if you would like to meet and none of the available times work for you.

*Academic Integrity*

The course will adhere to the Academic Integrity Policy of the Colorado State University General Catalog (http://catalog.colostate.edu/general-catalog/policies/students-responsibilities/) and the Student Conduct Code (https://tilt.colostate.edu/integrity/knowTheCode/). At a minimum, violations will result in a grading penalty in this course and a report to the Office of Student Resolution Center. Do your own work. Don't cheat.

*Resources for Disabled Students*

If you have a diagnosed learning or physical disability, which may require special accommodations, please talk to me at the beginning of the semester. The university's Resources for Disabled Students (http://rds.colostate.edu/) can also help facilitate your individual needs. I will work with you and the RDS to make sure that any individual needs are appropriately accommodated.

*Support*

Any student who may be the victim of sexual harassment, sexual misconduct, relationship violence, stalking or retaliation is encouraged to report to CSU through one or more of the following resources:

- Emergency Response 911
- Deputy Title IX Coordinator/Office of Support and Safety Assessment (970) 491-1350
- Colorado State University Police Department (non-emergency) (970) 491-6425

For counseling support and assistance, please see the CSU Health Network, which includes a variety of counseling services that can be accessed at: http://health.colostate.edu/
And, the Sexual Assault Victim Assistance Team is a confidential student resource that does not have a reporting requirement and that can be of great help to students who have experienced sexual assault. The web address is http://www.wgac.colostate.edu/need-help-support.

Need Help? CSU is a community that cares for you. If you are struggling with drugs or alcohol and/or experiencing depression, anxiety, overwhelming stress or thoughts of hurting yourself or others please know there is help available. Counseling Services has trained professionals who can help. Contact 970-491-6053 or go to http://health.colostate.edu. If you are concerned about a friend or peer, tell someone by calling 970-491-1350 to discuss your concerns with a professional who can discreetly connect the distressed individual with the proper resources (http://supportandsafety.colostate.edu/tellsomeone). Rams take care of Rams. Reach out and ask for help if you or someone you know is having a difficult time.

**COURSE OUTLINE**

Please note, this is a tentative schedule. If (and when) there are changes to this schedule, you will receive adequate notice. All substantive topics below will also be covered in Stata. Throughout the semester, additional Stata topics we will cover include inputting data; labeling, recoding, and creating new variables; do files; data visualization; and basic programming.

| # | Date | Substantive topics | Reading | Due |
|---|---|---|---|---|
| 1 | 1/23 | Introduction, hypotheses, association and causality, levels of measurement; sampling | Ch 1&2 | |
| 2 | 1/30 | Intro to data and Stata, | Ch 3 | |
| 3 | 2/6 | Descriptive statistics: measures of the center and of variability | | HW 1 |
| 4 | 2/13 | Bivariate descriptives | Ch 3 | HW 2 |
| 5 | 2/20 | Probability distributions, normal distribution | Ch 4 | HW 3 |
| 6 | 2/27 | Inference: Point and interval estimation, confidence intervals | Ch 5 | HW 4 |
| 7 | 3/6 | Significance tests, p-values | Ch 6 | HW 5 |
| 8 | 3/13 | Comparison of two groups, t-tests | Ch 7 | HW 6 |
| | 3/20 | SPRING BREAK! | | |
| 9 | 3/27 | Tests for tables, Chi-square | Ch 8 | HW 7 |
| 10 | 4/3 | Midterm | | Exam! |
| 11 | 4/10 | Intro to Linear regression | Ch 9 | |
| 12 | 4/17 | Intro to Multivariate relationships | Ch 10 | Proposal |
| 13 | 4/24 | Multiple regression | Ch 11 | HW 8 |
| 14 | 5/1 | Regression with categorical predictors, categorical and dummy variables, ANOVA | Ch 12, 13 | HW 9 |
| 15 | 5/8 | Intro to Regression with categorical outcomes: logistic regression | Ch 15 | |
| | 5/14 | Take-home final due by 4pm | | Final exam |
| | 5/17 | Research paper due via email by midnight. | | Final paper |