SECU 620 - 1
Research Methods II

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☗ Course material on Blackboard

COURSE DESCRIPTION

This course is a continuation of Research Methods I (SECU 615). After learning research design and descriptive statistical methodology in Research Methods I, students will be exposed to inferential statistical methodology, which they can incorporate into their research design.

Learning Objectives:

- The first third of the semester will be dedicated to refreshing the link between causal theory development and research design. Though the course description indicates that statistical inference is the primary focus of the class, we are not interested in simply establishing correlation, and any of the methods we will discuss in the latter parts of the class are useless without a solid understanding of theory development, conceptualizing cause and effect, and determining how to move from theoretical concepts to operational measurements and data collection.

- In the second third of the semester students will build on their knowledge of causality and research design by moving into descriptive and statistical inference. While the first third of the class ends with an understanding of how to measure our theoretical concepts of interest, the second third will address how to deal with data we have collected to represent our theoretical concepts. The middle third of the class will first start by telling us how to use descriptive statistics to understand our data. We will then proceed to discuss the basics of statistical inference—taking what we know from a sample to make inferences about a population. This middle portion of the class will end with an introduction to bivariate hypothesis testing.

- In the final third of the semester students will be exposed to linear regression analysis, its assumptions and limitations. While bivariate hypothesis testing is important for establishing a first attempt at discerning a relationship between cause and effect, it is often the case that our theories will be more complicated than a simple bivariate correlation or difference of means and require more variables to adequately test hypotheses. This lends itself to an introduction to regression—first bivariate, then multivariate. We will finish the class by exploring what regression can and cannot do; the latter focusing on what happens when our data are not adequate for linear regression.

- Each of the three learning objectives above serve two purposes: First, to help students understand how to read and interpret the methods of others when reading books, articles, or other manuscripts. Secondly, the objectives above are aimed at helping students apply the methods learned in this class to their own research (papers, dissertation chapters, theses, etc.).

READINGS

Readings for the course will consist of books and a set of articles (listed by topic below). Articles and selected chapters will be posted in the appropriate topic folder in the `Content` section on Blackboard.

Required: The following texts are required for the class.

- Firebaugh, Glenn. 2008. *Seven Rules for Social Research.* Princeton, NJ: Princeton University Press.

    - "Firebaugh" is an excellent example of how to carry out research—with the general focus of social science research—whether it be for a thesis or dissertation, or a research paper. Let it be a guide as you cultivate your own research ideas and turn those ideas into papers, chapters, etc.

- Kellstedt, Paul M. and Guy D. Whitten. 2013. *The Fundamentals of Political Science Research.* Cambridge, MA: Cambridge University Press.

    - "K & W" will be our primary text as we move through the semester, learning some very general methods for analysis and how to implement and interpret those methods in your own research. Note that there is a 2009 edition of this text as well; both that edition or the most recent edition will be fine for this course. However, since chapters and some content have changed across editions, I will point out reading requirements for both editions.

Suggested: The following texts are suggested, but not required for the class. Consider the following to be readings that you may find useful for conducting research in the future. The list includes texts on scientific inquiry as well as general and more advanced texts on econometrics. I would be happy to provide more suggestions if you ask.

On qualitative and quantitative methods:

- King, Gary, Robert Keohane, and Sidney Verba. 1994. *Designing Social Inquiry: Scientific Inference in Qualitative Research.* Princeton, NJ: Princeton University Press.

- Goertz, Gary and James Mahoney. 2012. *A Tale of Two Cultures: Qualitative and Quantitative Research in the Social Sciences.* Princeton, NJ: Princeton University Press.

- Brady, Henry E. and David Collier. 2010. *Rethinking Social Inquiry: Diverse Tools, Shared Standards.* Lanham, MD: Rowman and Littlefield Publishers, Inc.

General and more advanced texts on statistics:

- Allison, Paul D. 1999. *Multiple Regression: A Primer.* Thousand Oaks, CA: Pine Forge Press.

- Gujarati, Damodar and Dawn Porter. 2008. *Basic Econometrics.* McGraw-Hill Education, 5th ed.

- Wooldridge, Jeffrey M. 2000. *Introductory Econometrics: A Modern Approach.* South-Western College Publishing.

COURSE DETAILS

Math Expectations: As the course description may indicate, there will be math, especially in the last two-thirds of the class. If math does not come easy to you do not be discouraged. There are a few things I can suggest that may help if you do not feel confident doing math. All of my suggestions are from my own experience looking back at what I *wish* I knew when I first started learning statistics in graduate school.

- Most mistakes are our own errors and are the result of not carefully checking your work; this is especially so when we rush, so give yourself plenty of time to work through problems. In fact, one of the best ways to avoid mistakes is to do the work multiple times; you're less likely to make a mistake if you attempt something multiple times. The more you attempt a problem the more you may find mistakes in your previous work. Of course this means making more work for yourself, but I never said these suggestions are easy!

- Do not rush over equations, thinking that all you have to do is plug in numbers and that's it. Take the time to read through equations and understand what each part is doing; the textbooks and lectures will spend some time on this, but it is best if you get in the habit of thinking through equations yourself.

- You will find that many of the equations we will encounter are actually related to previous equations; if this isn't evident, you might want to take a look back at previous topics, or keep in mind when you encounter a new equation that this may appear similar to something you will learn later on.

Class Format: This class will largely consist of readings and video lectures each week, representing a "lecture" format online. Students will be given a link to assigned video lectures, and all video lectures will be posted on the Tuesday of every week. So for instance, the second week of class starts on January 24 (Tuesday), and there will be a video lecture posted on that Tuesday; video lectures for the third week will be posted on January 31 (Tuesday), and so on. Students are expected to complete the readings, watch the video lectures, and complete any problem sets listed by the start of the next week. Problem sets and assignments are posted in advance, due dates are listed next to each assignment on the schedule below.

Statistical Computing: While many of you will use more advanced programs to analyze data in the future—SPSS, Stata, R—all of the material we will cover will largely consist of the nuts and bolts of estimation and statistical inference, and can be learned by hand with a minimum of a calculator, and implemented successfully in Excel. The department has an SPSS license, and though the class will not be focusing primarily on teaching students SPSS, the statistical methods that students will learn can more easily be implemented in that program. Students will be learning many computations by hand so that when students attempt to use these methods through a program like SPSS, they have a more comprehensive understanding of what happens when they press ⏎Enter .

Grading: Students will be assessed according to the following grade scale:

A (93–100)	**A−** (90–92)	**B+** (87–89)	**B** (83–86)	**B−** (80–82)
C+ (77–79)	**C** (73–76)	**C−** (70–72)	**D** (66–69)	**F** (≤ 65)

Grades for the class will be based on the following assignments:

Problem Sets (7 Total)	⋄		350
Research Paper	⋄		250
Midterm Examination	⋄		200
+ **Final Examination**	⋄		200
Total	⋄	1000/10 =	100%

ASSIGNMENTS

Problem Sets: There will be frequent homework assignments throughout the semester. The problem sets and their deadlines are listed in the course schedule below. Students will have a week to complete each

problem set. I'm indifferent as to whether students work together or alone when attempting these assignments. If working alone is useful for you, do it, but if you work together make sure that you understand the material on your own after the group work ends; having the correct answer is useless unless you know how and why you ended up at that answer. Additionally, if you work in groups I require that everyone submits his or her own copy of the homework.

Examinations: There will be two examinations—one midterm, one final. Examinations will be open book, but students may not collaborate. There will be a set number of days that students will have to complete each exam—the schedule below lists a "distribution date" and a "due date".

- **Midterm Examination** distributed Mar. 1, 8:00 am EST; due Mar. 3, 5:00 pm EST

- **Final Examination** distributed May 9, 8:00 am EST; due May 11, 5:00 pm EST

Paper: Students are expected to write a research paper that utilizes some portion of the methods learned in this class. The paper will be due the last week of class, which will give students time to prepare for the final examination. Students are advised to use this paper as something that can turn into an independent research project, part of a thesis, or a dissertation chapter. The paper will be expected to follow the foundations of scientific inquiry we will repeatedly encounter in this class; in other words, it must contain a theory, a summary of outside literature and its relevance to the argument in the paper, a hypothesis or hypotheses that are derived from the theory, data collection, data analysis and inference, and a conclusion that reassess the theory and hypotheses given your analysis. Students must submit a (1) one page paper proposal that outlines the paper's research question, theory, and data sources.

- **Paper Proposal** due Feb. 25, 5:00 pm EST

- **Research Paper** due May 2, 5:00 pm EST

COURSE SCHEDULE

Topic 1:   Course Introduction   Jan. 17

- Read the syllabus.

- Firebaugh, **Ch. 1**.

- Read "Guide to Writing a Scientific Paper" on Blackboard. Note that some of the content in this document will become more relevant as the semester progresses. However, this should provide an excellent standard for understanding the final paper's structure.

Topic 2:   Developing and Evaluating Causal Theories   Jan. 24

- Firebaugh, pp. 120–129.

- K & W (2009/2013), **Ch. 1 and 2**.

- Watch video lectures in content folder.

Topic 3: Research Design Jan. 31

<div style="border:1px solid black; background:#90ee90; display:inline-block; padding:4px">**Problem Set 1 Due Feb. 6, 5:00 pm EST**</div>

- Firebaugh, **Ch. 2** and pp. 18–23.
- K & W (2009/2013), **Ch. 3 and 4**.
- Watch video lectures in content folder.

Topic 4: Measurement Feb. 7

- Firebaugh, **Ch. 3**.
- K & W (2009), **Ch. 5**; K & W (2013), pp. 92–109.
- Watch video lectures in content folder.

Topic 5: Descriptive Statistics Feb. 14

<div style="border:1px solid black; background:#90ee90; display:inline-block; padding:4px">**Problem Set 2 Due Feb. 20, 5:00 pm EST**</div>

- K & W (2009), **Ch. 6**; K & W (2013), pp. 109–126.
- Watch video lectures in content folder.

Topic 6: Statistical Inference Feb. 21

<div style="border:1px solid black; background:#dd77aa; display:inline-block; padding:4px">**Paper Proposal Due Feb. 25, 5:00 pm EST**</div>

- Firebaugh, **Ch. 4**.
- K & W (2009), **Ch. 7**; K & W (2013), **Ch. 6**.
- Watch video lectures in content folder.

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MIDTERM EXAMINATION
Distributed: Mar. 1, 8:00 am EST
Due: Mar. 3, 5:00 pm EST

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No Class
Spring Break
Mar. 6 − 12

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Topic 7: Bivariate Hypothesis Tests Mar. 14

<div style="border:1px solid black; background:#90ee90; display:inline-block; padding:4px">**Problem Set 3 Due Mar. 20, 5:00 pm EST**</div>

- K & W (2009), **Ch. 8**; K & W (2013), **Ch. 7**.
- Watch video lectures in content folder.

Topic 8:   Bivariate Regression I Mar. 21

Problem Set 4 Due Mar. 27, 5:00 pm EST

- K & W (2009), **Ch. 9**; K & W (2013), **Ch. 8**.

- Watch video lectures in content folder.

Topic 9:   Bivariate Regression II Mar. 28

Problem Set 5 Due Apr. 3, 5:00 pm EST

- K & W (2009), **Ch. 9**; K & W (2013), **Ch. 8**.

- Watch video lectures in content folder.

Topic 10:   Multiple Regression I Apr. 4

- Firebaugh, pp. 129–152.

- K & W (2009), **Ch. 10**; K & W (2013), **Ch. 9**.

- Watch video lectures in content folder.

Topic 11:   Multiple Regression II Apr. 11

Problem Set 6 Due Apr. 17, 5:00 pm EST

- Firebaugh, pp. 152–164.

- K & W (2009), **Ch. 10**; K & W (2013), **Ch. 9**.

- Watch video lectures in content folder.

Topic 12:   Multiple Regression III Apr. 18

Problem Set 7 Due Apr. 24, 5:00 pm EST

- Firebaugh, **Ch. 6**.

- K & W (2009), **Ch. 11**; K & W (2013), **Ch. 10**.

- Watch video lectures in content folder.

Topic 13:   How to Present Results Apr. 25

- Kastellec, Jonathan P. and Eduardo L. Leoni. 2007. Using Graphs Instead of Tables in Political Science. *Perspectives on Politics* 5(4):755–771. (Blackboard)

- Watch video lectures in content folder.

Topic 14:   Catch-up or Advanced Topics May 2

Research Paper Due May 2, 5:00 pm EST

- Firebaugh, **Ch. 7**.

- Watch video lectures in content folder.

FINAL EXAMINATION
Distributed: May 9, 8:00 am EST
Due: May 11, 5:00 pm EST

COURSE GUIDELINES

Late Assignments: No late work will be accepted. In the case of an emergency—where an assignment cannot be completed by the deadline—students are required to submit the work they have at the time of the emergency; I will judge the quality of the work, given the emergency.

Academic Honesty: Plagiarism and cheating are serious matters that, should they occur, will be pursued to the limits of University rules. Moreover, academic dishonesty will result in a failing grade for the course. For details regarding the University's policy on cheating and plagiarism and academic dishonesty more generally, please consult the University standards.

Students with Disabilities: Students with disabilities should register with the Office of Specialized Services (201.200.2091), K-105. Extra time and necessary arrangements can be made in conjunction with that office and the instructor.

Course Website/Syllabus: Please visit the course website on Blackboard. The online version of the syllabus is the official syllabus for this course as it is updated periodically. I reserve the exclusive right to alter the syllabus if I feel such changes are necessary for the class.