

**Public Affairs 819:  
Advanced Statistical Analysis for Public Policy Analysis  
Spring 2019**

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**Office Hours:** Friday, 1:30 – 4:30 PM

**Class Meeting Times:**

**Lectures:** Monday, 3:30 – 4:45 PM in Grainger 2180  
Wednesday, 3:30 – 4:45 PM in lab (TBA)

**Discussion 301:** Thursday, 11:00 – 11:50 AM in Social Work 106  
**Discussion 302:** Friday, 12:05 - 12:55 PM in Social Science 6112  
**Discussion 303:** Thursday, 3:30 – 4:20 PM in Education L159

**Course Credits:** This is a 3-credit course. The credit standard for this course is met by an expectation of a total of 135 hours of student engagement with the courses learning activities (at least 45 hours per credit), which include regularly scheduled instructor-student meeting times, reading, writing, problem sets, studio time, labs, field trips, and other student work as described in the syllabus.

**Course Description:** The purpose of this course is to equip students with the tools necessary to tackle issues that involve the empirical analysis of public policy problems of the sort they might encounter in a professional environment. Specifically, the course introduces students to the use of multiple regression analysis for analyzing data. The emphasis is on empirical applications.

**Course Learning Outcomes:** The course is designed with twin objectives in mind. The first is to provide students with the ability to analyze critically empirical analysis done by others at a level sufficient to make intelligent decisions about how to use the analysis in the design of public policy. The second is to provide students with the skills necessary to perform empirical policy analysis on their own and in groups. To this end students are will learn how to complete empirical exercises using STATA and write-up their findings. These empirical exercises will cover the gamut of statistical topics covered throughout the semester including multivariate regression, regression with binary dependent variables, regression with panel data, instrumental variables, the estimation of treatment effects with differences-in-differences, experiments, and regression with time series data. Take home exams are designed to evaluate each student's ability to complete exercises utilizing these techniques on their own.

**Required Text:** Stock, James H., and Watson, Mark, W. (2012). Introduction to Econometrics (3th edition), Pearson Publishing. **ISBN-10:** 0138009007, **ISBN-13:** 9780138009007

**Required Software:** Access to Microsoft Excel and STATA. STATA may be accessed a number of ways. The first method for accessing STATA is through the Social Science Computing Cooperative's (SSCC) Winstat servers. All students in the class will receive a one-semester Winstat account from SSCC. Both STATA and Excel are installed on the Winstat server and on computers in the SSCC computer labs. STATA is available for download free of charge for personal computers. After clicking on the link select "University of Wisconsin - Madison", and log in using your NetID and password. Lastly, STATA is installed on all of the computers in the La Follette computer lab.

**Course Requirements:** Students are expected to attend all lectures and discussions sessions. In addition students are responsible for the completion of periodic problem sets. These problem sets will largely be computer based.

- **Problem Sets:** Students will be responsible for the completion of periodic problem sets. These problem sets will be graded using a check-, check, check+ grading scale. Students are encouraged to work in groups on problem sets, but each student must turn their own work. Under no circumstance will late homework be accepted. The problem sets will account for 15 percent of the grade and are intended to provide intensive practice in applying the tools developed in lecture.
- **Group Exercise:** After Spring break you will be randomly assigned to a group of 2-4 students and provided with a data set to analyze using the econometric methods discussed in class. As part of this assignment your group will produce a written report describing the research question(s), data, econometric models employed, estimation results, and conclusions. Your group will also be responsible for a short (10 minute) presentation of your results. These presentations are tentatively scheduled for May 2. Half your grade on the group exercise will be determined by report with the other half being determined by your group's presentation.

**Discussion Sections:** All students enrolled in this class should be assigned to a discussion section with Yuseob Lee. These discussion sections will meet once a week throughout the course of the semester. In discussion sections the problem sets from the previous week will be reviewed, old material may be rehashed, questions will be answered, and, on occasion, new material will be presented. To get the most out of the course attendance and active participation in these discussion sections will be vital. Subject to space constraints, and regardless of your enrollment status, you may attend any discussion of the three discussion sections.

**Exams:** There will be a take-home midterm examination and a take-home final examination. The midterm exam is scheduled for March 13. The timing of the cumulative final will be announced in the coming weeks.

**Grades:** The following weights will be used in computing your final grade

|                               |            |
|-------------------------------|------------|
| Midterm Exam . . . . .        | 20 percent |
| Final Exam . . . . .          | 40 percent |
| Problem Sets . . . . .        | 15 percent |
| Group Exercise . . . . .      | 15 percent |
| Class Participation . . . . . | 10 percent |

### Tentative Class Schedule (subject to change)

| <b>Dates</b>   | <b>Topics(s)</b>   | <b>S&amp;W Chapters</b> |
|--|--|-------------------------|
| January 23   | Syllabus/Course  | 1                       |
| January 28, 30   | Bivariate Regression/Least Squares   | 4, 5                    |
| February 4, 6  | Multivariate Regression  | 6, 7, 8                 |
| February 11, 13  | Multivariate Regression  | 6, 7, 8                 |
| February 18, 20  | Models for Binary Dependent Variables/<br>Maximum Likelihood Estimation                    | 11                      |
| February 25, 27  | Models for Binary Dependent Variables/<br>Maximum Likelihood Estimation                    | 11                      |
| March 4, 6   | Internal and External Validity<br>Threats to Internal and External Validity                | 9                       |
| March 11   | Slack/Review   |                         |
| <b>** MIDTERM EXAM – Wednesday March 13 – Take home exam</b> |  |                         |
| <b>March 18, 21</b>  | <b>SPRING BREAK</b>  |                         |
| March 25, 27   | Program Evaluation: Randomized Experiments   | 13.1-13.3               |
| April 1, 3   | Program Evaluation: Natural Experiments,<br>Differences-in-Differences                     | 13.4-13.7               |
| April 8, 10  | Regression with Panel Data: Fixed and Random Effects                                       | 10                      |
| April 15, 17   | Endogenous Regressors and Instrumental Variables   | 9.2, 12                 |
| April 22, 24   | Instrumental Variables, Regression with time Series Data/<br>Estimation of Dynamic Effects | 14, 15                  |
| April 29, May 1  | Group Exercise Presentations   | 15                      |

**\*\*FINAL EXAM – TBA – Take home exam**