Instructor: John Hore

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Class Schedule: Spring Semester runs from Wednesday, January 22nd through Tuesday, May 6th. We will have Spring Break from March 17th through March 23rd.

Although there is no specified class time, assignments will be due on Mondays by 8 pm (Eastern). All class materials, including assignments, will be posted on Blackboard for the entirety of the semester, so students can work ahead if they choose.

Blackboard: Please check the Blackboard website for the class often. You can find lecture notes, papers, and datasets there. I will also post announcements there and respond to discussion threads.

Textbook: The textbook for this class is “Microeconometrics – Methods and Applications” by Cameron and Trivedi (ISBN: 0521848059). This is an older text, so plenty of used copies should be available. It is fairly mathematically advanced, so if you are struggling with the notation, you might find “Mostly Harmless Econometrics” by Angrist and Pischke (ISBN: 0691120358) to be a helpful and more intuitive supplement.

Course Outline: This class is will cover a range of advanced econometric techniques frequently employed in the analysis of individual-level micro data. Topics include difference-in-differences, OLS, instrumental variables, limited dependent variable analysis (i.e. Logit, Probit, Tobit, etc.), and panel data techniques. The class is mainly empirical in nature. We will cover some relevant theory in the lecture notes, but we will focus on applications of this theory. The materials posted for most units will include Stata code containing empirical examples to supplement the lecture notes. Some units will also include in-depth discussions of empirical papers that employ the different techniques that we study. I deliberately front-load a lot of the assignments to leave you more time to work on the research project, described below, later in the semester.

Course Level Objectives: Students are expected to understand the concepts covered (using the lecture notes, Stata code, and assigned reading) and how they are applied empirically. Progress toward these objectives will be measured through regular assignments, discussion topics, and a semester-long research project highlighting one (or more) of the techniques covered (see below).

Research Project: In a project that will span the duration of the semester, you will take on the role of a researcher or policy analyst and choose a dataset (one among those posted on our course Blackboard site, or with special permission, a dataset of your
choosing), and these data will become the basis for the empirical work you will do in this class. Because research projects are often collaborative in nature, you have the option of working in groups of 2 (if you so choose). To complete this project, you will:

1. Formulate one or more policy or research questions to address.
2. Explore your data (using descriptive statistics) and identify limitations of your data, refining your research question(s) if needed.
3. Specify hypotheses that you will test empirically.
4. Identify statistical methods appropriate for your data and analysis.
5. Specify statistical models to test.
6. Conduct sensitivity analyses (if appropriate) of alternative model specifications.
7. Interpret the results of your statistical analyses in terms of the research questions and hypotheses you defined at the onset of the study.
8. Make a presentation to your peers of your study findings, including a discussion of your analytical approach.

To undertake this work, it will be essential for you to become skilled in using a statistical processing program such as Stata or SAS. I will cover a basic overview of Stata in Unit 2, but it will be up to you to practice and hone the skills necessary to complete your project. Homework assignments will also help you develop the skills needed to complete your final project. Datasets are posted on the class Blackboard site, ready to download and use. I encourage you to use one of the provided datasets, which will make it easier for me to provide you with technical assistance.

**Grading and Deadlines:** There will be six homework assignments, worth a combined 50% of your final grade. Where necessary, I have posted a rubric that explains what I am looking for in each assignment and how that assignment will be graded. These rubrics will be available all semester long, in case you want to start working ahead (see the "Assignment Guidelines" section of Blackboard).

**Assignment 1 [5%]** (due 2/3). The first assignment is a simple introduction to some basic Stata commands.

**Assignment 2 [10%]** (due 2/10). The second assignment is a research proposal that identifies the question(s) of interest for your research project, discusses the data source that you will use, and briefly lays out your proposed empirical framework. The rubric is posted in the "Assignment Guidelines" section of Blackboard.

**Assignment 3 [5%]** (due 2/24). The third assignment is another Stata exercise, which tests your knowledge of dummy variables and interaction terms.
Assignment 4 [10%] (due 3/10). The fourth assignment is a literature review for a topic of your choosing. The topic can be the same as your research paper, or it can be a completely new topic. The rubric will be posted all semester long.

Assignment 5 [10%] (due 3/31). The fifth assignment is a preliminary draft of your paper that contains some descriptive statistics and preliminary results. The rubric will be posted all semester long.

Assignment 6 [10%] (due 4/14). The sixth assignment is another Stata exercise. I provide you with data and ask you to estimate some models like those we have encountered in class and discuss the results.


Presentation of Final Paper [10%] (due 5/5). Students will prepare presentations of their final research papers and share them with the class in our final discussion topic of the semester.

The remaining 10% of the overall grade will be based on your participation on the discussion boards.

All assignments should be uploaded prior to 8pm Eastern on the due date. Please note that all deadlines listed above are hard deadlines and late submissions will receive zero credit. I will generally grade assignments and give feedback within a week of the due date. For general questions asked via email or the discussion forums, I will try to respond within 24 hours (48 hours on weekends).

Schedule: The course will be taught in units. Most units will be covered in a single week, but one will take two weeks. The corresponding textbook chapters are listed, but since the class is focused on empirical applications, I will supplement the textbook readings with selected papers. The lecture notes and supplemental materials (including assignments) will be posted on the Blackboard website all semester long.

Unit 1 (Week 1): Course introduction, overview of statistical theory and matrix algebra.

Unit 2 (Week 2): Introduction to Stata, students to analyze CPS and NLSY datasets for research projects.

Unit 3 (Week 3): Microeconometrics overview: data and models (Chapters 2 & 3), Difference-in-Differences estimation.

Unit 4 (Weeks 4&5): Ordinary Least Squares (Chapter 4).
Unit 5 (Week 6): Linear Models Beyond OLS: Generalized Least Squares (GLS), Seemingly Unrelated Regression (SUR), Quantile Regression (Chapter 4).

Unit 6 (Week 7): Instrumental Variables (IV) (Chapter 4).

Unit 7 (Week 8): Maximum Likelihood Estimation (Chapter 5).

Unit 8 (Week 9): Binary Outcome Models – Logit & Probit (Chapter 14).

Unit 9 (Week 10): Multinomial Models (Chapter 15).

Unit 10 (Week 11): Tobit and Selection Models (Chapter 16).

Unit 11 (Week 12): Panel Data (Chapter 21).

In Week 13, you will finalize your research papers and submit them by 4/28. In Week 14, each student will post a presentation of their final paper in our final discussion topic of the semester.

Other Policies:

Getting Help:

You have a variety of methods to get help on Blackboard. Please consult the help listed in the "Technical Help" link for important information. **If you encounter technical difficulty in completing or submitting any online assessment, please immediately contact the designated help desk listed on the AAP online support page.** Also, contact your instructor at the email address listed atop this syllabus.

University Policies:

General

This course adheres to all University policies described in the academic catalog. A few to pay close attention to are noted below. JHU Ethics Statement: The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition. Report any violations you witness to the instructor.
Plagiarism

Read and adhere to JHU’s Notice on Plagiarism.

Dropping the Course

You are responsible for understanding the university’s policies and procedures regarding withdrawing from courses found in the current catalog. You should be aware of the current deadlines according to the Academic Calendar.

Students with Disabilities

Johns Hopkins University is committed to providing reasonable and appropriate accommodations to students with disabilities. Students with documented disabilities should contact the coordinator listed on the Disability Accommodations page. Further information and a link to the Student Request for Accommodation form can also be found on the Disability Accommodations page.