

# ECO 508: Research Methods for Policy Analysis II

## Winter 2021

*DePaul University - Department of Economics*

**Time:** Tues 5:45pm-7:15pm

**Room:** Zoom

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DePaul Center, Room 6209

**Office Hours:**

Thursday 4:00pm-5:00pm (or by appointment)

**Textbook:**

(1) A.H. Studenmund, *Using Econometrics: A Practical Guide*, 7<sup>th</sup> Edition

(2) Joshua Angrist and Jorn-Steffen Pischke, *Mastering `Metrics: The Path from Cause to Effect*.

Along with these books, I will assign several articles to read. The readings will be available for download in PDF format from D2L.

This course will also use the statistical software, Stata. Stata is available on all computers in all computer labs under "statistics/economics". It can also be accessed online using the virtual lab. However, it is a good idea to buy a license for the software, you can purchase a 6 (12) month license of Stata IC for \$48 (\$94) by going to <https://www.stata.com/order/new/edu/gradplans/student-pricing/>.

**Course Description:**

What separates economics from most other social sciences is that our discipline begins with a few basic assumptions and utilizes these as building blocks for models of behavior. Models are only useful if they can be tested and economists have developed a large toolkit of statistical models that are used to test these theories, estimate the magnitudes of economic relationships, and predict economic aggregates. This class has two main components: (1) applying the linear regression model and cross-sectional data to better understand the causal relationships between economic variables, and (2) using the linear regression model and time series data to predict economic outcomes. We will finish up by introducing how panel data will help up better estimate causal effects. Infused in each of these sections will be exposure to academic studies and hands-on practice with real data, where students will be asked to estimate models and interpret their results.

**Prerequisites:**

ECO 507 (or permission of instructor)

**Assessment of Students:**

Problem Sets (5):	35%
Midterm:	25%
Final exam:	35%
Class Participation:	5%

**Assignments:**

**Problem Sets:** Five problem sets will be assigned during the semester. These problem sets are designed to gauge your understanding of the concepts discussed in class and will include derivations, interpretations of results, regression specification, and analyses of results. Students are encouraged to work in groups of 2 on the problem sets. Problem set answers should be turned in at (or emailed to me by) the beginning of class on the day they are due. Late problem sets will be marked down one grade for each day they are late. Problem sets will (generally) not be accepted after the 3rd day or once the answers have been posted on D2L.

**Midterm:** There will be a midterms for this course that will be held on . The first one will be on 2/2/20 and will count for 25% of your final grade. I expect that it will cover the topics in weeks 1-4.

**Final Exam:** The final exam for the class will include a series of empirical exercises that will focus on the time series aspects of the course, but also a little of the first half material. It is due on Friday 3/19/21 at 8pm.

**Important Dates:**

Problem Set #1 Due:	January 19 <sup>th</sup>
Problem Set #2 Due:	January 26 <sup>th</sup>
Midterm #1:	February 2 <sup>nd</sup>
Problem Set #3 Due:	February 16 <sup>th</sup>
Problem Set #4 Due:	February 23 <sup>rd</sup>
Problem Set #5 Due:	March 9 <sup>th</sup>
Final:	March 19 <sup>th</sup>

## **Syllabus: ECO 508**

### **I. Analyze, Interpret, and Apply the Linear Regression Model**

#### **Week 1: Review OLS Regression with Cross Sectional Data with an Emphasis towards Causality**

- Readings: (1) Mastering `Metrics: Introduction and Chapter 1  
(2) Detailed Notes on the Derivation of the Simple Regression Model and the Multivariate Regression Model (posted on D2L)

### **Week 2: Applications of the Linear Regression Model:**

- Readings: (1) “The Oregon Experiment: Effects of Medicaid on Clinical Outcomes,” by Baicker et al., *New England Journal of Medicine*, 2013.  
(2) “Estimating the Payoff to Attending a More Selective College,” by S. Dale and A. Krueger, *Quarterly Journal of Economics*, 2002.  
(3) Mastering Metrics, Ch. 2

### **Week 3: Models with limited dependent variables and Applications**

- Readings: (1) Studemund, Ch. 13  
(2) “Keeping College Options Open: A Field Experiment to Help all High School Seniors through the College Application Process,” by P. Oreopoulos and Ford, *Journal of Policy Analysis and Management*, 2019.

### **Week 4: Instrumental Variables and Applications**

- Readings: (1) Studemund, Ch. 14  
(2) “Children and their Parent’s Labor Supply: Evidence from Exogenous Variation in Family Size,” by J. Angrist and W. Evans, *American Economic Review*, 1998.  
(3) “Immigrant Inflows, Native Outflows, and the Local Labor Market Impacts of Higher Immigration,” by D. Card, *Journal of Labor Economics*, 2001.  
(4) Mastering Metrics, Ch. 3

### **Week 5: Structural vs. Reduced Form Analysis in Econometrics**

- Readings: (1) “Structural vs. Atheoretical Approaches to Econometrics,” by Michael Keene, *Journal of Econometrics*, 2010.  
(2) “Intertemporal Labor Supply and Human Capital Accumulation,” by Imai and Keane, *International Economic Review*, 2004.

## **II. Forecasting and Time Series Analysis**

### **Week 6: Time Series Data, Forecasting, and Seasonality Models**

- Readings: (1) Studemund, Ch. 12  
(2) “Where the Latest Covid-19 Models Think We are Headed, and Why they Disagree,” FiveThirtyEight

### **Week 7: Stationarity, External Validity, and ARIMA Models**

- Readings: (1) Studemund, Ch. 15  
(2) “A Mean-Reverting Walk Down Wall Street” by DeBondt and Thaler, *Journal of Economic Perspectives*, 1989.

### **Week 8: Static and Distributed Lag Models**

Readings: (1) Posted Notes

- (2) “Testing Distributed Lag Models of Advertising Effect,” Bass and Clarke, *Journal of Marketing Research*.

### **Week 9: Alternative Approaches to Prediction**

Readings: (1) “Machine Learnings: An Applied Econometric Approach,” by Mullainathan and Spiess, *Journal of Economic Perspectives*, 2017.

- (2) “Big Data: New Tricks for Econometrics,” by Hal Varian, *Journal of Economic Perspectives*, 2014.

- (3) “A Machine Learning Approach to Low-Value Healthcare: Wasted Tests, Missed Heart Attacks, and Mis-predictions,” by Mullainathan and Obermeyer, *NBER Working Paper*, 2019.

## **III. Panel Data and Differences-in-differences Models**

### **Week 10: Introduction to Panel Data and Differences-in-differences Models**

Readings: (1) Studenmund, Ch. 16

- (2) Mastering ‘Metrics, Ch. 5

### **Additional Expectations:**

**Academic Integrity:** Work done for this course must adhere to the University Academic Integrity Policy, which you can review in the *Student Handbook* or by visiting Academic Integrity at DePaul University (<http://academicintegrity.depaul.edu>).

**Respect:** The classroom is a place for learning. This is best achieved by asking questions, thinking out loud, and even making mistakes. Please treat all of your classmates with respect - we will all struggle at some point or another. If anyone has concerns about the behavior of other people in the class, come see me right away.

**Timeliness:** All assignments are due as posted in this syllabus. If you foresee a problem with a due date (or midterm date), see me in advance and I may grant you an extension. All unapproved late submissions will be marked down.

**Disability:** Students with disabilities that require additional time on exams or other efforts on my behalf, must let me know in advance as well as provide me with all of the relevant (electronic) paperwork.