

**ECO 375: Introductory Econometrics**  
**Winter 2020**  
*DePaul University - Department of Economics*

**Time:** Mon/Wed 10:10am-11:40am

**Room:** DePaul Center, Rm 6308B

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DePaul Center, Room 6209

**Office Hours:**

Monday 3:00pm-5:00pm,

Or, by appointment, though I am rarely far from email

**Textbook:**

Michael A. Bailey, *Real Econometrics: The Right Tools to Answer Important Questions*, 1<sup>st</sup> or 2<sup>nd</sup> Edition, Oxford University Press.

Along with this book, I will post detailed notes and occasionally assign academic articles to read. The notes and readings will be available for download in PDF format from D2L.

This course will also use the statistical package, Stata. Stata is available on all computers in all computer labs under "statistics/economics". It can also be accessed online using 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. The workhorse statistical model in the social sciences is the ordinary least squares (OLS) regression. The bulk of the course will be spent outlining the theory behind and the properties of the OLS model. The course will not, however, just be an abstract exercise. For each topic, I will first present the standard textbook treatment of the topic. Next, we will read some academic papers that use the techniques outlined in class. Students will be expected to read the assigned papers and be able to discuss not only the econometric techniques used but also discuss the economic issues and assess the empirical support for them in the studies. Lastly, we will also engage in our own empirical analysis both inside of class and out. I will provide sample code that illustrates how one would obtain estimates given appropriate data.

The class will use the Stata statistical software. Stata is a fast and versatile program that was written by economists so it is more intuitive for people in our field. Stata is also the program of choice for applied micro economists.

**Prerequisites:**

ECO 105, ECO 106, and MAT 137 (or equivalent)

I have put together a 20 page review of the basic statistics that you need for this course. It is available on D2L. This handout goes over most of the important concepts that will be used this semester such as expected values, covariance, correlation, linear combinations of random variables, hypothesis testing, testing the equality of means from two samples, etc. Please read over the handout in the first week, but then continue to use it as a resource.

Familiarity with the software package, Stata, is NOT a pre-requisite. It is actually quite easy to use. Additionally, we will have 4 classes in the computer lab where we work through the program together. The first of these will be held on Wednesday 1/22/20. The three others will be Wednesday 2/5/20, Monday 2/24/20, and Wednesday 3/11/20.

**Assessment of Students:**

Problem Sets (5):	15%
Midterm 1:	25%
Midterm 2:	25%
Final Paper:	30%
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. The problem sets will have three types of questions. The first are "pencil-to-paper" where you are asked to calculate an estimate, derive an equation, or discuss the implications of a set of assumptions. The second are "interpretation" questions where you are asked to interpret a set of results. These two types of questions are the types that will tend be asked on the exams. For the third type of question, you will given a data set and asked to generate and interpret statistical output. You can use any statistical software package to answer these questions but I will provide sample programs and support (i.e., I will answer questions) for Stata.

You 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.

The first problem set is a Statistics Review exercise and is due on 1/13/20.

**Weekly Quizzes:** We will have a brief (5 minute) "quiz" every Wednesday in class. The material for these quizzes will come from class work from the two previous classes. The purpose of these quizzes is to force you to keep up with the material, to give you early/regular feedback on your performance, and to help me understand what students are not understanding (so we can review this material some more).

**Midterms:** There will be two midterms for this course. The first one will be on 2/12/20 and will count for 25% of your final grade. I expect that it will cover Topics 1-5. The second one will be a take-home midterm and due on Monday 3/9/20 and also count for 25% of your final grade. I expect that it will cover Topics 6-9. While the second midterm will not technically be cumulative, understanding the material in the first part of the class is essential to understanding the material in the second part of class.

**Final Paper:** The final assignment for this class will be a final paper, which will bring together everything you have learned in the class. It is due on Wednesday 3/18/20 at 8pm. More information about the project will be given later in the quarter but in a nutshell, I'll provide you with 10-12 potential research questions and a data set to address each issue. You (and a partner if so desired) will choose a topic and then seek to answer the question as best you can. Since there will be more than 10 groups, several groups will pursue the same topic. No more than 3 groups can pursue any one topic.

I expect that the paper will include: a statement of your research question, a review of the relevant literature, an explanation of your empirical approach, and a description of your results. The assignment will be distributed in mid-February and groups will be formed and topics chosen by the end of February. Grades on the paper will be based on the quality/clarity of the writing, the justification for the empirical model you estimate, and the accuracy with which you interpret your statistical models.

**Important Dates:**

Problem Set #1 Due:	January 13 <sup>th</sup>
Class in Computer Lab:	January 22 <sup>th</sup>
Problem Set #2 Due:	January 27 <sup>th</sup>
Class in Computer Lab:	February 5 <sup>th</sup>
Problem Set #3 Due:	February 10 <sup>th</sup>
Midterm #1:	February 12 <sup>th</sup>
Class in Computer Lab:	February 24 <sup>th</sup>
Problem Set #4 Due:	February 26 <sup>th</sup>
Paper Group and Topic Due:	February 26 <sup>th</sup>
Problem Set #5 Due:	March 4 <sup>th</sup>
Midterm #2 (Take Home):	March 9 <sup>th</sup>
Class in Computer Lab:	March 11 <sup>th</sup>
Final Paper Due:	March 18 <sup>th</sup>

**Syllabus: ECO 375  
Winter 2020**

- I. Introduction and Statistics Review (1/6/20)**  
Readings: Detailed notes posted to D2L  
Math and Probability Appendix in Bailey
- II. Moving from Correlation to Causation (1/8/20)**  
Readings: Bailey, Chapter 1-2
- III. The Bivariate Regression Model (1/13/20-1/22/20)**  
Readings: Bailey, Chapter 3 & Chapter 14  
Detailed notes posted to D2L
- IV. Bivariate Regression Model: Inference (1/27/20)**  
Readings: Bailey, Chapter 4
- V. Multivariate Regression Model: Estimation and Inference (1/29/20-2/10/20)**  
Readings: Bailey, Chapter 5  
Detailed notes posted to D2L
- VI. Dummy Variables, Interaction Terms, and Nonlinearities (2/17/20)**  
Readings: Bailey, Chapter 6
- VII. Limited Dependent Variable Regressions (2/19/20)**  
Readings: Bailey, Chapter 12
- VIII. Applications (2/24/20)**  
Corrado, Giulitetti, Mirco Tonin, and Michael Vlassopoulos, "Racial Discrimination in Local Public Services," *Journal of the European Economic Association*, 2017.
- IX. Panel Data Methods (2/26/20-3/4/20)**  
Readings: Bailey, Chapter 8
- X. Time Series and Forecasting Methods (3/4/20-3/11/20)**  
Readings: Bailey, Chapter 13

### **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.