Department of Economics
University of California San Diego

Spring 2021

ECON 121
Applied Econometrics and Data Analysis
Syllabus

Time: Monday / Wednesday / Friday, 1:00-1:50 p.m. / 4:00-4:50 p.m.
Course webpage: https://canvas.ucsd.edu/courses/25172
Github repo (for datasets, example code, problem set solutions): https://github.com/tvogl/econ121

Professor: Tom Vogl
E-mail: tvogl@ucsd.edu
Office hours: Friday 2:00-4:00 p.m. on Zoom (see Canvas for link)

Teaching assistant: Connor Redpath
E-mail: credpath@ucsd.edu
Office hours: TBA

COURSE DESCRIPTION

Theoretically develops extensions to the standard econometric toolbox, studies their application in scientific research, and applies them to data. Emphasis is on using techniques, and on understanding and critically assessing others' use of them. Requires practical work on the computer using a range of data from around the world. Topics include advanced regression analysis, maximum likelihood, discrete choice, nonparametric methods, causality, panel data, instrumental variables, and regression discontinuity designs. Prerequisite: ECON 120C.

TEXTBOOK

The course will be based on lecture notes, posted on the course website before each lecture. A textbook is **NOT** required.

ASSIGNMENTS

The course assigns four **problem sets** involving empirical analysis using Stata. You may work in R rather than Stata if you wish, but all course materials (class examples, problem set solutions) will use Stata. Each problem set asks you to: (i) code up a Stata do file or R script and (ii) respond in writing to questions that test your understanding. A Stata do file or R script that answers questions in comments is ideal. For the coding part of the problem set, you may work in groups of four or fewer. You submit the code on Gradescope under Problem Set # (do-file). Connor runs the code on his computer; you will lose points if the code does not run. For written answers to problem set questions, you must write your answers independently. So create the Stata do file or R script and write the code as a team, but then afterwards independently write your own answers as comments in the Stata do file or R script. If your written answers are identical to a classmate's, you will receive 0 points; repeating offenders will be reported to the Academic Integrity Office. You submit a pdf of the Stata log file or R script on Gradescope under Problem Set # (log-file). Connor grades your answers like a usual quiz. Late assignments are not accepted, but the lowest problem set grade is dropped.

The course also assigns four academic articles as case studies. Based on your stated preferences, you will be assigned to participate in a **group presentation** of one article, in which the group leads an in-class discussion of the article. For the remaining articles, you will submit a one-page (single-spaced, 12-point font) **reading response**, in which you *briefly* describe the article, assess and critique its methods and conclusions, and note any parts you did not understand. You may discuss the articles with each other, but you must write the responses on your own. As with the problem sets, if your response is identical to a classmate's, you will receive 0 points; repeating offenders will be reported to the Academic Integrity Office. Responses are due by noon on the day we discuss the article in class. As with problem sets, late responses will not be accepted, but the lowest grade will be dropped.

At the end of the quarter, you will submit a **final reading response** on an article of your choosing in a leading economics journal.[1] You should choose an article that relies on a method we covered in class to study a question that interests you. The format will be the same as for the case studies: one page, single spaced, in 12-point font. As with the case studies, you should describe the article, assess and critique its methods and conclusions, and note any parts you did not understand.

FINAL EXAM

The **final exam** will be 3 hours long. It will mimic a problem set, providing you with a dataset and asking a number of questions about it. It will be open book, but you may not communicate with anyone while taking it. Connor will grade the exam. If you think you lost points in error, discuss the issue with Connor for clarification. If you are not satisfied, you may challenge the grade, but Prof. Vogl will regrade the whole test, including questions you did not challenge. You may lose points.

PARTICIPATION

Participation matters for your course grade, but it can take on many forms. Some students ask questions during lecture; others are more active during discussions about academic articles; and others come to office hours with thoughtful questions. The key is to demonstrate engagement.

ACADEMIC INTEGRITY

Academic Integrity means striving to learn the course material and not copying the work of others.

- For group presentations and problem set coding, academic integrity means working together and contributing to the group effort, **not** just waiting for everyone else to do all the work.
- For reading responses and problem set write-ups, academic integrity means using your own words to demonstrate your understanding, **not** copying someone else's words or thoughts.
- For the final exam, academic integrity means demonstrating your understanding of the course material and solving problems the way you think is best, **not** using others' notes as your own, looking at others' responses, or communicating with others during the exam.

Academic Integrity is important because it is fair and ensures the value of a UCSD diploma. We will grade material fairly, in a timely manner, and report violations of academic integrity as needed.

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[1] Choose an article published since 2006 in one of the following 10 journals: *American Economic Journal: Applied Economics, American Economic Journal: Economic Policy, American Economic Review*, *Econometrica*, *Economic Journal, Journal of Political Economy, Journal of the European Economic Association, Review of Economic Studies, Review of Economics and Statistics,* and *Quarterly Journal of Economics*. If you want guidance of are interested in an article that is unpublished or in a journal not on this list, ask Connor or Prof. Vogl.

STATA

The course makes extensive use of the software package Stata. UCSD has a campus-wide license for Stata. You can access the installation files and license information on Canvas. Here are some tips:

- *Stata help*: Stata's help files are tremendously useful, and even the most experienced data analysts will often check them before using a command. Type: help [command].
- *Stata manuals*: When you have an in-depth question about a command, or when you want to see better examples of the command, Stata's manuals will better address your needs. You can access a PDF of a command's manual entry by clicking the blue title at the top of its help file.
- *Web resources*: Many websites provide additional help.
    - UCLA: http://stats.idre.ucla.edu/stata/
    - UCSD: https://ucsd.libguides.com/data-statistics/stata
    - When feeling completely lost, just Google "Stata how to …"
- *Data examples from lecture*: I will post files from classroom data examples on the course website, which you may find helpful for the problem sets.

GRADING

Letter grades will be assigned on a curve based on the weighted average of performance on deliverables. The curve will follow typical economics department standards and will be identical for the two sections of the course. The curve can be adjusted to accommodate exceptional circumstances (e.g., a year with many exceptional students), but in practice, such adjustments are rarely necessary in courses with more than 20 students (as in this course).

Because grades are assigned on a curve, if you receive a low score on an assignment or exam, you should check the distribution of scores before you panic; if the exam was hard, your low score may translate to a good letter grade. The use of a curve also implies that assignments without much variance in the distribution of scores (e.g., a problem set on which everyone did well) will not strongly influence your final grade.

Grades are based on the following weighted average:

Participation: 5%
Group presentation (1): 5%
Case study reading responses (2/3): 15%
Problem sets (3/4): 30%
Final reading response (1): 15%
Final exam (1): 30%

CLASS SCHEDULE

Week 1 (3/29, 3/31, 4/2): Introduction, Bivariate Linear Model

Week 2 (4/5, 4/7, 4/9): Multivariate Linear Model

Week 3 (4/12, 4/14, 4/16): Nonparametric Methods

Monday, 4/12
Article 1: Abramitzky, Ran, Leah Boustan, Elisa Jacome, and Santiago Perez. (2021). "Intergenerational Mobility of Immigrants in the United States over Two Centuries." *American Economic Review* 111(2): 580-608.
https://www.aeaweb.org/articles?id=10.1257%2Faer.20191586

Week 4 (4/19, 4/21, 4/23): Maximum Likelihood, Binary Dependent Variables

Wednesday, 4/21
Problem Set 1 due

Week 5 (4/26, 4/28, 4/30): Other Limited Dependent Variables

Week 6 (5/3, 5/5, 5/7): Panel Data

Wednesday, 5/5
Problem Set 2 due

Week 7 (5/10, 5/12, 5/14): Causality

Monday, 5/10
Article 2: Akosa, Antwi, Yaa, Asako S. Moriya, and Kosali Simon. (2013). "Effects of Federal Policy to Insure Young Adults: Evidence from the 2010 Affordable Care Act's Dependent-Coverage Mandate." *American Economic Journal: Economic Policy* 5(4): 1-28.
https://www.jstor.org/stable/43189352

Week 8 (5/17, 5/19, 5/21): Instrumental Variables

Wednesday, 5/19
Problem Set 3 due

Week 9 (5/24, 5/26, 5/28): Regression Discontinuity Designs

Monday, 5/24
Article 3: Aizer, Anna, and Joseph J. Doyle, Jr. (2015). "Juvenile Incarceration, Human Capital, and Future Crime: Evidence from Randomly Assigned Judges." *Quarterly Journal of Economics* 130(2): 759-803.
https://www.jstor.org/stable/26372613

Wednesday, 5/26
Select three options for articles you would like to read for the final reading response. You will be assigned one of them.

Week 10 (6/2, 6/4): Conclusion

Wednesday, 6/2
Problem Set 4 due

Wednesday, 6/2
Article 4: Asher, Sam, and Paul Novosad. (2020). "Rural Roads and Local Economic Development." *American Economic Review* 110(3): 797-823.
http://www.aeaweb.org/articles?id=10.1257/aer.20180268

End of Quarter

Saturday, 6/5, 7-10pm
Final Exam

Wednesday, 6/9, 11:59pm
Final reading response due