Department of Economics
University of California San Diego

Winter 2020

ECON 121
Applied Econometrics and Data Analysis
Syllabus

Time: Monday / Wednesday / Friday, 1:00-1:50 p.m. / 2:00-2:50 p.m.
Classroom: SOLIS 110
Course webpage: https://canvas.ucsd.edu/courses/9205

Professor: Tom Vogl
E-mail: tvogl@ucsd.edu
Office hours: Wednesday 3:00-5:00 p.m. in ECON 314

Teaching assistant: Connor Redpath
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Reader: Ariel Chiang
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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**, primarily involving empirical analysis using Stata. You may work in R rather than Stata if you wish, but all course materials (lectures, problem set solutions, and exams) will use Stata. You may work in teams of four or fewer. For each problem set, you will be required to turn in a Stata do file, a Stata log file, and a write-up of your results. You must include the names of all group members at the top of the do and log files, and all of you may turn in the same do and log files. But you must complete the write-up independently. If your write-up is identical to a classmate's, you will receive 0 points; repeating offenders will be reported to the Academic Integrity Office. Late assignments will not be accepted, but the lowest problem set grade will be 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-sided, single-spaced, 12-point font) **article summary**, in which you describe the article and assess its methods and conclusions. You may discuss the articles with each other, but you must write the summaries on your own. As with the problem sets, if your summary is identical to a classmate's, you will receive 0 points; repeating offenders will be reported to the Academic Integrity Office. Summaries are due by noon on the day we discuss the article in class. Also as with the problem sets, late assignments will not be accepted, but the lowest grade will be dropped.

QUIZZES AND FINAL EXAM

The course has three short quizzes and a conventional final exam. In all cases, you will be permitted to bring the following materials for reference: the course lecture notes (with your annotations, if applicable), any personal notes that you prepared BY YOURSELF (not with a group), and a calculator (any is fine, but no phones, tablets, or computers). The questions will focus on choosing appropriate methods for specific research questions, on interpreting econometric estimates, and on performing simple calculations based on the estimates. Mathematical derivations will be limited.

Quizzes will be 20 minutes long. Their goal is to keep you on track with course material throughout the quarter, and to give you experience with Prof. Vogl's style of writing questions, so you are prepared for the final exam. The questions will be multiple choice. No partial credit will be given for incorrect answers. The lowest quiz grade will be dropped.

The **final exam** will be 3 hours long, covering material from the whole course. The questions will be short answer but will otherwise be similar to the questions on the quizzes.

Connor (TA) and Ariel (reader) will grade quizzes and exams. If you think you may have lost points in error, you can discuss the issue with Connor for clarification. If you are not satisfied with the clarification, you may challenge the grade, but Prof. Vogl himself will regrade your whole test, including the questions that you did not challenge. As a result, you may end up losing points from the challenge.

TA OFFICE HOURS

Connor will hold weekly office hours. On weeks in which problem sets are due, office hours will be held in the economics department computer lab. On other weeks, office hours will be held in a smaller room. Rooms and times will be announced early in the quarter.

PARTICIPATION AND CLASSROOM ENVIRONMENT

Participation matters for your course grade, but it can take on many forms. Some students ask questions and give comments during lecture; others are more active during discussions about academic articles; and others come to office hours frequently with thoughtful questions about course material. The key is to demonstrate engagement. As for classroom etiquette, there is one rule: **to avoid distracting others, if you wish to use a laptop during class, you MUST sit in the back row.**

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 through the course page on Canvas.

Here are some useful resources for tips on using Stata:

- *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 a more in-depth question about a command, or when you want to see better examples of the command in use, Stata's manuals will better address your needs than the help files. Recent versions of Stata come with PDFs of the manuals; you can link to them by clicking the blue title at the top of a command's 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 extremely rare 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 a quiz 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 that everyone did well) will not strongly influence your final grade.

Grades are based on the following weighted average:

Participation: 5%
Group presentation (1): 5%
Article summaries (2/3): 10%
Problem sets (3/4): 15%
Quizzes (2/3): 20%
Final exam (1): 45%

CLASS SCHEDULE

Week 1 (1/6, 1/8, 1/10): Introduction, Bivariate Linear Model

Week 2 (1/13, 1/15, 1/17): Multivariate Linear Model

Friday, 1/17
Article 1: Case, Anne, and Christina Paxson. (2008). "Stature and Status: Height, Ability, and Labor Market Outcomes." *Journal of Political Economy* 116(3): 499-532.
https://www.jstor.org/stable/10.1086/589524

Week 3 (1/22, 1/24): Nonparametric Methods

Friday, 1/24
Problem Set 1 due

Week 4 (1/27, 1/29, 1/31): Maximum Likelihood, Binary Dependent Variables

Monday, 1/27
Quiz 1 (on material from weeks 1-3)

Week 5 (2/3, 2/5, 2/7): Other Limited Dependent Variables

Friday, 2/7
Problem Set 2 due

Week 6 (2/10, 2/12, 2/14): Panel Data

Friday, 2/14
Article 2: Gentzkow, Matthew, Jesse Shapiro, and Michael Sinkinson. (2011). "The Effect of Newspaper Entry and Exit on Electoral Politics." *American Economic Review* 101(7): 2980-3018.
http://www.jstor.org/stable/41408728

Week 7 (2/19, 2/21): Causality

Friday, 2/21
Problem Set 3 due

Week 8 (2/24, 2/26, 2/28): Instrumental Variables

Monday, 2/24
Quiz 2 (on material from weeks 4-7)

Friday, 2/28
Article 3: Dahl, Gordon, Andreas Ravndal Kostol, and Magne Mogstad. (2014). "Family Welfare Cultures." *Quarterly Journal of Economics* 129(4): 1711-52.
https://doi.org/10.1093/qje/qju019

Week 9 (3/2, 3/4, 3/6): Regression Discontinuity Designs

Friday, 3/6
Article 4: Asher, Sam, and Paul Novosad. (Forthcoming). "Rural Roads and Local Economic Development." *American Economic Review*.
http://www.dartmouth.edu/~novosad/asher-novosad-roads.pdf

Week 10 (3/9, 3/11, 3/13): Stata to R, Conclusion

Monday, 3/9
Quiz 3 (on material from weeks 8-9)

Friday 3/13
Problem Set 4 due