

Syllabus, Intro Econometrics, San José State University, Summer 2018

Economics 103, *Introduction to Econometrics*, Section 1, SP 18

Instructor/Email/Phone*:	Matthew Holian, Ph.D / Matthew.Holian@sjsu.edu / 408-924-1371
Office Hours* / Location:	The instructor is available to meet before or after class. <i>Drop-in office hours are from 10:00a.m. to 10:45a.m. in DMH 131.</i> Appointments can be made for other times.
Lecture Room/ Lab Room	Central Classroom Building 101
Days / Times:	Monday and Wednesday / 11:00a.m. to 4:30p.m.
Prerequisites:	Econ 3 or equivalent

*Email is my preferred form of communication. Also, during final exam week, office hours are by appointment only.

Faculty Web Page, Canvas and Communication Issues

Canvas is the Learning Management System at SJSU. Please be sure you can log in and are receiving my announcements. Although I will be communicating with the class through Canvas, if you have an individual question for me, please email me directly. For info on accessing Canvas visit <https://sjsu.instructure.com>.

Course Description

This course is designed to give students marketable skills in core econometric analysis, while providing a survey of advanced topics in econometrics. Midterm and final exams focus intensely on a few core topics, including estimating simple and multiple regression models, conducting hypothesis tests, and use of nonlinear models, and the important caveats related to these methods most relevant for applied research.. Advanced topics, such as panel data methods, qualitative choice models, quasi-experiments, instrumental variables, and time series topics, will be addressed with limited detail in lectures. Students in this class will obtain data and conduct original econometric research

Course and Program Learning Objectives (CLOs and PLOs)

This course emphasizes three PLOs: **research methods** (ECON PLO3), **quantitative methods** (PLO4d), and **communication** (PLO5). Course Learning Objectives for ECON 103 include:

CLO 1.) Explain core methods in econometrics and identify correct procedures.

CLO 2.) Discuss advanced econometric topics at a conceptual level.

CLO 3.) Access data and use computer software to estimate econometric models.

CLO 4.) Interpret econometric models estimated with computer software.

CLO 5.) Locate data, format it to be read by regression software, and develop, estimate and interpret an original econometric model to shed light on a problem of social importance.

CLOs 1, 2 & 4 will be assessed with exams, CLO 3 with weekly lab assignments, and CLO 5 by term paper.

Required Textbooks

- 1.) Bailey, Michael A. 2017. *Real Econometrics: The right tools to answer important questions*. New York, NY Oxford University Press.

This course will follow the book closely. Buy it and read it.

- 2.) Sundstrom, William A. and Michael J. Kevane. *Guide to R: Data analysis for Economics*.

This is available as a free PDF document (at <http://rpubs.com/wsundstrom/home>) It has answers to all of the typical R questions students have for an introductory econometrics course. Download it and read it!

Required Computer Software

All students should have installed on their personal machines 1.) A spreadsheet program, and 2.) A statistical software package. I will provide support for MS Excel, Stata and R. As a student, you can purchase a six-month license for Stata IC for \$45 (www.stata.com/order/new/edu/gradplans/student-pricing/). For R, we will use the R Studio interface; see the first chapter of the *Guide to R* by Sundstrom and Kevane for information on downloading these free software programs. The "Computing Corner" sections at the end of every chapter of the Bailey text, as well as his "Useful Commands for R" table on pages x-xi, are also helpful. But, the Sundstrom and Kevane PDF and their accompanying tutorial scripts (R files), are the only resources you need to consult for econometric tasks you need to complete for this course.

Assignments

Total points on all assignments sum to 100. Below you will find an explanation for each of these assignments.

<i>Assignment</i>	<i>Points</i>	<i>Due Dates</i>
Midterm and Final Exams	45 (15 points each)	6/13, 6/25 and 7/2
Assignments	30 (typically worth 1 point each)	Announced in Class
Term Paper	25 (5 points for outline, 5 for draft, 5 for presentation & 10 for final paper)	Outline 6/13, Draft 6/25, Presentatic and Final Paper 7/2

Midterm and Final Exams

There will be two midterms and one final exam. Midterm 1 covers Bailey Chapters 1-4. Midterm 2 covers Bailey Chapters 5-7 & 12.1. The final exam is comprehensive (Bailey Ch 1-7 & 12.1) and also covers advanced techniques concepts discussed in class on 6/27. There are no bathroom breaks during exams so please plan accordingly.

Weekly Assignments

Most Assignments are data exercises designed to give you experience using computer software and managing data. In addition, hands on experience with the data will reinforce the statistical and econometric theory and methods and thus help to prepare you for taking the exams. Points on these and other Assignments, announced in class and on Canvas, are easy to earn. Late assignments are accepted for partial credit on a case by case basis.

Term Paper

Students will write an original paper on a question of scholarly interest. After developing a research question, and formulating a hypothesis, the main tasks involved in carrying out an applied econometric study include: identifying and accessing cross-sectional or panel data (no time series), formatting the data for analysis, analyzing the data using appropriate statistical techniques, and producing tables that summarize the data and report the results of the analysis. The term paper will also survey econometric literature and describe economic theory that relates to the research question.

By June 13, you will choose a topic, collect data, and write up an outline that contains your project's title, five sections with section names, a one sentence research question, detailed data references, the regression equation you plan on estimating (indexing variables to make it clear what is the unit of observation) and a citation to a closely related publication. On July 2nd you will make a short presentation, using slides. The draft is due on 6/25 and the final paper is due on 7/2.

All papers must have six sections with the following titles: Introduction, Literature Review & Economic Theory, Description of Data, Empirical Results, Conclusion, References. Sections (except the last) will be about five paragraphs in length and each paragraph about five sentences. This "5x5" suggestion is a rule-of-thumb and need not be followed exactly. However papers must have these three tables: Variable Descriptions, Summary Statistics, and Regression Results. Original figures are encouraged; copied figures are prohibited. Tables must be formatted *exactly* as described in class and References *must* be in APA format.. All papers must also write out an equation describing the empirical model. Holian (2014) closely follows this format.

As a set of minimal standards for regression models, all papers should report more than one model specification in Table 3 (the Regression Results table.) One of these specifications should contain at least three distinct variables (e.g. a polynomial specification of one variable does not count as more than one), and one of the variables must be continuous. You should also estimate at least one nonlinear model, i.e. include polynomial, logarithmic, and/or interaction

variables. In the Conclusion, all students must critically evaluate the models they present, and discuss ways to improve them in future work. Any attempts at using advanced techniques (sample weighting, panel methods, etc.) will ceteris paribus earn a higher grade, but it is possible to write an A paper using multiple regression with a good control strategy. Finally, students must use data from the American Community Survey (ACS) in some way. Data can be either microdata at the person or household-level, or aggregate; if aggregate data is used, students can choose the unit of analysis (e.g. city, county, PUMA, etc.) BUT it must contain data from at least two different time periods (i.e. it must be panel data).

Tips on finding and accessing published econometric research

Here are three options for locating published econometric research: 1.) search the JSTOR database. <http://library.calstate.edu/sanjose/databases/alphabetical?alpha=J>, limit your search to Econ journals in Advanced Search, and search using keywords in your area of interest; 2.) search the EconLit database (change end of link above from “J” to “E”). You can search by keyword; try also to search by subject (SU) and JEL code: <https://www.aeaweb.org/econlit/jelCodes.php>; 3.) Often there is one “seminal” article that most researchers who are studying similar topics to you cite. If this is true for the area you are studying (and even if it isn’t) go to Google Scholar, search for a study, and click the ” button. This is a convenient way of doing a cited reference search. (Note: When you find articles on Google or through other web search, you will often need to access the university’s subscriptions. Our library subscribes to most scholarly journals.¹ Go to <http://library.sjsu.edu/> and click Journal Titles. Enter the journal title. You can do this faster; on Google Scholar, set up “library links” under “settings”.)

Rubrics for evaluating Outlines, Rough Drafts and Term Papers

Criteria	Description of Criteria for Outlines
<i>Topic</i> (1 point)	Is the research question specific and does it relate to an interesting causal question in a relevant economics literature? Does it identify one or more relevant JEL codes, and reference one or more relevant publications?
<i>Data</i> (2 points)	Can the reader gain a clear picture of the data source and the measures contained in it? Is there a reference to a web link (if available) where a reader could access the data to be used? Does it contain a regression equation with an available dependent variable and one independent variable, i.e. a baseline model? Is the estimation subsample clearly specified?
<i>Organization</i> (1 points)	Does it appear the student read Chapter 10 of SW (Brief Edition?) Does it appear the student read and understood the requirements for the term paper described in the syllabus?
<i>Difficulty</i> (1 points)	Are appropriate data and variables employed or does the choice of data or variables reflect “convenience”?

¹Various metrics rank journals according to “impact factors” such as those at: <https://ideas.repec.org/top/top.journals.simple.html>

Rubrics for evaluating Rough Drafts and Term Papers

Criteria	Description of Criteria for Papers
<i>Organization</i> (up to 1.5 pts)	Is the Research Question clearly stated? Are there five sections? Are sections given correct titles? Does content of a section match its title? Is there a title and abstract? References?
<i>Grammar</i> (up to 1.5 pts)	Does each paragraph have a topic sentence? Do all sentences develop one controlling idea? Does paper use appropriate grammar (punctuation, syntax, usage)? Is the paper free of spelling errors? Are citations used appropriately?
<i>Style</i> (up to 1.5 pts)	Does paper avoid the passive voice? Does paper avoid use of the word "stated"? Does paper avoid split infinitives? Overall, is the writing style and voice appropriate? Does it appear the student read contemporary and seminal studies and is it written in the style of the profession? Does it appear the student read Langlois' notes on writing? http://web.uconn.edu/langlois/writing/style.html
<i>Content I</i> (up to 2.5 pts)	A specific causal research question must relate to a relevant economics literature and good data must be used to shed light on the question. The literature review must be integrated and not merely an annotated bibliography, and it must discuss ways the state-of-the art studies handle well-defined econometric problems (such as OVB and SCB).
<i>Content II</i> (up to 3 pts)	The student must obtain data, estimate econometric models and present the results in an easy to read format, and highlight strengths and limitations of the econometric model, and suggest directions for future research.

For presentations I will be looking for 5 things:

Criteria	points
A well-posed causal question.	1
A literature review that describes one or more past attempts to estimate the causal effect of interest. The talk should also cover either one or both of: <ol style="list-style-type: none"> a. A discussion of an advanced technique (AB, DD, IV, RD) b. A discussion of a study that used the ACS 	2
A baseline model + X	1
A discussion of future work needed to improve upon the estimate of the causal effect	1

Course Schedule (Subject to change)

Date	Topic	Readings assigned for next class
4-June	Intro to Econometrics and Statistical Computing; Using STATA, R and R Studio; The Quest for Causality; Presenting Data in Tables and Figures	Sundstrom & Kevane pp. i-ii & 1-12; Bailey pp. xviii-xxvi, Ch 1 and Ch 2; ACS Codebook & Survey Instrument
6-June	Good Data Practices & American Community Survey; Regression with Two Variables; Estimating Models and Reporting Regression Results; Hypothesis Testing	Bailey Ch 3 & 4
11-June	Exam Review and Term Paper Work Day	
13-June	Midterm 1; Regression with > 2 Variables; Outline Due	Bailey Ch 5
18-June	Multiple Regression (continued); Interpreting Models with Dummy Variables	Bailey Ch 6 and Section 12.1
20-June	Nonlinear Regression Models; Exam Review	Bailey Ch 7
25-June	Midterm 2; Rough Drafts Due	
27-June	Advanced Topics: Panel Data Methods; Instrumental Variables Regression; Techniques for Experimental Data; Regression Discontinuity Designs	Bailey Ch 8-11 (introductory sections of each chapter only)
2-July	Final Exam; Student Presentations; Term Papers Due	Covers Bailey Ch 1 – 11 & Sec. 12.1

Further reading / resources:

Angrist, J. D. and Pischke, J. 2014. *Mastering Metrics*, Princeton University Press, Princeton, N.J. (Download the Introduction and Chapter 1 at the following link: <http://press.princeton.edu/titles/10363.html>)

Stock, J.H. & Watson, M.W. 2011. Introduction to Econometrics. Pearson 3rd ed. (*or other editions*)

www.wired.com/2012/04/ff_abtesting