

San José State University (1/25/2019)

Economics 2C, *Statistics Lab*, Section 1, FA 18

Instructor/Email*:	Matthew Holian, Ph.D / Matthew.Holian@sjsu.edu
Office Hours* / Location:	by appointment
Lecture Room/ Lab Room	NA -- This is an online class with no physical meeting location
Prerequisites:	STAT 95 or other three-unit intro statistics class

*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 complement and add to a three-unit, traditional statistics class. All economics students require a solid foundation in statistics. In this course, students will use actual data and statistical software to conduct original statistical analysis. The class will not meet physically and all assignments and announcements will be through Canvas. Please pay close attention to announcements and deadlines.

Course and Program Learning Objectives (CLOs and PLOs)

This course emphasizes three PLOs: *research methods* (ECON PLO3), *quantitative methods* (PLO4d), and *communication* (PLO5). Five specific Course Learning Objectives for ECON 2:

CLO 1.) Explain core methods in statistics and identify correct procedures. CLO 2.) Access data & use computer software to carry out statistical tests. CLO 3.) Interpret statistical tests estimated with computer software. CLO 4.) format data to be read by regression software, and develop, estimate and interpret an original statistical test to shed light on a problem of social importance. CLOs 1, 2 and 3 will be assessed with weekly lab assignments, and CLO 4 by a term paper.

Required Textbook Resources

- 1.) Angrist, J. D. and Pischke, J. 2014. *Mastering Metrics*, Princeton University Press, Princeton, NJ.
- 2.) Sundstrom, William A. and Michael J. Kevane. *Guide to R: Data analysis for Economics*.

All resources required for this class are free, as you will only need Chapter 1 of the Angrist and Pischke book (you can download it for free at the following link, though you should buy this book if you plan to take further stats-related courses: <http://press.princeton.edu/titles/10363.html>) and the Sundstrom and Kevane book is also available as a free PDF document (at <http://rpubs.com/wsundstrom/home>) It answers all of the typical R questions students have.

Required Computer Software

All students should have installed on their personal machines 1.) A spreadsheet program, such as MS Excel, and 2.) The R statistical software package. Along with R, we will use the R Studio interface; read the first chapter of the *Guide to R* by Sundstrom and Kevane for information on downloading these free software programs.

Assignments and Grading

Passing this class requires earning at least 10 Weekly Lab Assignment points AND passing the Term Paper. In the table below you will find the total points associated with these assignments. Explanations for each of these assignments follow the table.

<i>Assignment</i>	<i>Points</i>	<i>Due Dates</i>
Weekly Lab Assignments	15 (1 point each)	Fridays @ 11:59p.m.
Term Paper	1	Final Paper 5/3

Weekly Lab Assignments

The Weekly Assignments are designed to give you experience using computer software and carrying out statistical tests, and exploring statistical concepts discussed in selected textbook readings, with actual data. Points on these Lab Assignments are relatively easy to earn if you submit them by the deadline. *Late assignments will not generally be accepted.* Descriptions for weekly assignments are found on Canvas. Answers, when available, will be provided on Canvas. Please compare your answers with the those provided; as this is an online course, students must be self-directed in identifying and remedying deficiencies in their understanding.

This class is roughly divided in three portions. In the first four weeks, students will read the first 50 pages of *Mastering Metrics*. This chapter, and especially the Appendix, contains a thorough yet concise review of important statistical concepts students learn in basic statistics courses. To ensure active reading, students will be required to submit weekly summaries of the readings, as well as specific answers to some questions based on the readings. You will also complete the first R and R Studio assignment (which covers installation and running of programs.)

After we have read MM Ch 1, Lab Assignments will focus more on problems. A major focus will be on understanding and carrying out the “difference in means” test. Finally, the third portion of the class will move from answering well-posed questions, to preparing students to do original statistical analysis. Problems will require students to become familiar with the American Community Survey data, and to select and prepare data from it for analysis. Students will also review the scholarly literature on their chosen topic, and describe and interpret relevant statistical findings from these studies. At the end of the term students will submit a mini-term paper which will present an original difference-in-means test, and compare and contrast the findings with previously published literature.

Term Paper

Students will carry out an original statistical analysis on a question of practical or scholarly importance, using data from the American Community Survey that the student will download as part of a lab assignment. (On Canvas, the Data folder contains ACS data as well as the survey questionnaire and codebook. You should open up the PDF files in the Data folder as soon as possible to begin familiarizing yourself with the data you will use in your term paper.)

After developing a research question, and formulating a hypothesis, the main tasks involved in carrying out an applied statistical study include: identifying formatting the data for analysis, analyzing the data using a difference in means test, and producing tables that summarize the data and report the results of the analysis. The term paper will also briefly survey econometric literature and describe economic theory that relates to the question. All papers must have five sections with the following section titles: Introduction, Literature Review and Economic Theory, Description of Data, Empirical Results, and Conclusion. In addition, all papers must

have the following three tables: Variable Descriptions, Summary Statistics (these appear in the Description of Data chapter), and Difference-in-Means Test Results (this table will appear in the Empirical Results section.) These tables must be formatted exactly as described on Canvas. Students will see an example of the type of tables that satisfy the requirements in one or more Weekly Lab Assignments. Please do not hesitate to ask if you are unsure of any of these requirements.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>"