San José State University
College of Social Science / Economics Department

Econ 103B Econometric Methods Spring 2023

Course and Contact Information

Instructor:	Dr. Paul Lombardi
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Office Hours:	Monday and Wednesday 4:00-5:00 pm or by appointment
Class Days/Time:	Monday and Wednesday 10:30-11:45 am
Classroom:	DMH 348
Prerequisites:	Econ 103A

Class Resources

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on the Canvas Learning Management System course login website at http://sjsu.instructure.com.

Course Description

A continuation of the econometric techniques and research methods introduced in 103A. Econometric techniques for panel data, instrumental variables, regression discontinuity, difference-in-difference designs, and an introduction to time series topics. Students will write a term paper building on research projects they completed in 103A. Prerequisite: ECON 103A.

Course and Program Learning Outcomes (CLOs and PLOs)

This course emphasizes PLO3: *research methods* and PLO5: *communication*. Specific CLOs for this course include: **CLO 1.) Explain intermediate methods in econometrics and identify correct procedures:** *1a.)* critically evaluate econometric models and point out potential sources of bias, *1b.)* explain how panel data and difference-in-difference designs can be used to overcome omitted variables bias, *1c.)* explain how instrumental variables designs can be used to overcome omitted variables and simultaneity bias, *1d.)* describe the requirements for a compelling regression discontinuity design, and *1e.)* compare and contrast time series techniques for prediction with econometric techniques for causal inference. **CLO 2.) Prepare a scholarly research paper describing a regression analysis**: *2a.)* Formulate an interesting and important research question, *2b.)* Locate useable data from the Internet or other sources *2c.)* Search and analyze scholarly literature

related to research question, *2d.)* Write a literature review, *2e.)* Develop a statistical model that can be used with the data to answer a question which contributes to the literature.

Required Texts/Readings

Textbook (Required)

1. Bailey, M.W., 2016. *Real Econometrics: The Right Tools to Answer Important Questions*. Oxford University Press; 1st edition. ISBN 978-0-19-029682-7
2. Angrist, Joshua, and Jorn-Steffen Pischke. *Mastering Metrics.* (New Jersey: Princeton University Press, 2015). A pdf version can be found on the class' Canvas website. ISBN 978-0-69115284-4

Textbook (Recommended)

1. Sundstrom, William A., and Michael J. Kevane. 2017. *Guide to R: Data analysis for Economics*.

- This title is available as a free PDF document at http://rpubs.com/wsundstrom/home. You can also find their tutorial scripts posted on the same page. The guide answers most of the typical R questions students in an introductory econometrics course.

Software (Required)

1. A Spreadsheet program (preferably MS Excel)
2. A statistical software package. You have two options:
    a. R and R Studio: See Sundstrom and Kevane (2017) for details
    b. STATA: Purchased through the following hyperlink: www.stata.com

Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at http://www.sjsu.edu/senate/docs/S12-3.pdf.

- There are four components to your grade: two exams (20%), activities (i.e., quizzes and discussions) (15%), term paper (45%), and homework assignments (20%).
- The exams will have short answer questions, and each will be worth 10% of your final grade. The exams are open book open note. You will be required to upload your answers to our Canvas as pdf files.
- Students will participate in several discussions and short quizzes; These activities are in addition to two five to ten-minute meetings. The meetings will be one on one with the professor. The intention of the meetings is to check on student progress and provide an opportunity to clarify challenging concepts.
- Students will be writing a term paper. The paper will be split into several assignments: an outline, rough draft, peer review, two presentations, final draft, and code log. For due dates, please see the Class Schedule. The paper grade is out of 45 points (i.e., 5 outline, 5 first presentation, 5 rough draft/ peer review, 5 second presentation, 5 code log, 20 final draft).
- There will be about four coding homework assignments throughout the semester.

Grading Information

Corresponding letter grades will be assigned as follows:

97 to 100% A plus	87 to 89% B plus	77 to 79% C plus	67 to 69% D plus	
93 to 96% A	83 to 86% B	73 to 76% C	63 to 66% D	
90 to 92% A minus	80 to 82% B minus	70 to 72% C minus	60 to 62% D minus	59 to 0% F

Late assignments submitted within one week of the due date will have a grade deduction of 30 percent. No credit is provided for any later submissions without prior approval.

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 at http://www.sjsu.edu/gup/syllabusinfo/

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's Catalog Policies section at http://info.sjsu.edu/static/catalog/policies.html. Add/drop deadlines can be found on the current academic calendar web page at http://www.sjsu.edu/provost/Academic_Calendars/. The Late Drop Policy is available at http://www.sjsu.edu/aars/policies/latedrops/policy/. Students should be aware of the current deadlines and penalties for dropping classes. Information about the latest changes and news is available at the Advising Hub at http://www.sjsu.edu/advising/.

Consent for Recording of Class and Public Sharing of Instructor Material

University Policy S12-7, http://www.sjsu.edu/senate/docs/S12-7.pdf, requires students to obtain instructor's permission to record the course. "Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material." "Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent."

Academic Integrity

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The University's Academic Integrity policy, located at http://www.sjsu.edu/senate/S07-2.htm, requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at http://www.sa.sjsu.edu/judicial_affairs/index.html. Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Policy S07-2 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act
If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at http://www.sjsu.edu/aec to establish a record of their disability

Economic Research Methods, Econ 103B, Spring 2023 Course Schedule

The following schedule is subject to change. If changes are needed, I will make announcements through email and Canvas.

Class Schedule

Week	Dates	Topics, Assignments, and Exams	Assigned Readings
0	1/25-1/29/23	Introduction and Syllabus	
1	1/30-2/5/23	Review of Econ 103A Material	AP Ch 1 and 2
2	2/6-2/12/23	Continue Review of Econ 103A Material	
3	2/13-2/19/23	Introduction of Instrumental Variables	AP Ch 3
4	2/20-2/26/23	Continue Instrumental Variables **(HW1 Due)**	Bailey Ch 9
5	2/27-3/5/23	Paper writing	SW 10
6	3/6-3/12/23	Introduction of Regression Discontinuities	AP Ch 4
7	3/13-3/19/23	Continue Regression Discontinuities **(HW2 Due)**	Bailey Ch 11
8	3/20-3/26/23	**First Student Presentations Due**	
9	3/27-4/2/23	Spring Break **(Exam One and Outline Due)**	
10	4/3-4/9/23	Introduction of Fixed Effects and Difference in Differences Models	AP Ch 5
11	4/10-4/16/23	Continue FE and DD **(HW3 Due)**	Bailey Ch 8
12	4/17-4/23/23	Dummy Dependent Variables **(Rough Draft Due)**	Bailey Ch 12
13	4/24-4/30/23	Introduction to Time Series **(HW4 Due)**	Bailey Ch 13
14	5/1-5/7/23	Meetings to Discuss Rough Drafts	AP Ch 6
15	5/8-5/14/23	**Second Student Presentation Due**	
16+	5/15-5/22/23	Review **(Exam Two, Code Log, and Final Draft Due)**	

Term Paper Instructions[1]

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 the economic theory related to the research question.

All students must read Stock and Watson's chapter titled, "Conducting a Regression Study Using Economic Data." By 4/2/23, 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. The rough draft is due on 4/23/23, and the final paper and code log are due on 5/22/23.

All papers must have five sections (plus a References section) with the following titles: Introduction, Literature Review & Economic Theory, Description of Data, Empirical Results, Conclusion. Sections will be about five paragraphs in length, and each paragraph about five sentences. 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 as described in class. 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, and also attempt using at least one advanced techniques (sample weighting, panel methods, etc.) Papers must include an abstract. In the Conclusion, students must critically evaluate the models they present and discuss ways to improve them in future work.

Rubrics for evaluating Outlines

Criteria	Description of Criteria for Outlines
Topic 20% of the score for the assignment	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?
Data 40% of the score for the assignment	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 at least one independent variable? Is the estimation subsample clearly specified?
Organization 20% of the score for the assignment	Does it appear the student read and understood Chapter 10 of SW (Brief Edition?) Does it appear the student read and understood the requirements for the term paper described in the syllabus?
Difficulty 20% of the score for the assignment	Are appropriate data and variables employed or does the choice of data or variables reflect "convenience"?

[1] This section borrows heavily from Professor Holian's Econ 103B syllabus.