

San José State University
Social Sciences/Economics
ECON 103, Introduction to Econometrics, Section 1, Fall, 2018

Course and Contact Information

Instructor:	Dr. Rui Liu
Office Location:	DMH 143
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Email:	rui.liu@sjsu.edu
Office Hours:	M 3pm to 4pm, and by appointment
Class Days/Time:	M W 1:30 pm to 2:45 pm
Classroom:	DMH 348
Prerequisites:	ECON 3 or its equivalent

Course Format

Computing

You are encouraged to use R with RStudio. R can be downloaded free from the R website

<https://cran.cnr.berkeley.edu/>.

RStudio can be downloaded free from <https://www.rstudio.com/products/rstudio/download/>.

However, you may use any package you wish, such as EViews, Excel, SAS, Stata, GRETL. You may also use Mathematica or Matlab. Mathematica can be downloaded free from the eCampus website by any SJSU student.

A good introduction to statistical packages can be found from <http://www.ats.ucla.edu/stat/>

Let me emphasize that you will be on your own for support with any package except R. Also, you are strongly discouraged from relying exclusively on Excel.

Course Description

The aims of this course are to study basic econometric techniques. The emphasis will be upon the understanding and use of econometric methodology, and the written and oral communication of the results of data analysis. Topics we will cover include simple and multiple regression models, dummy variables, multicollinearity, heteroskedasticity, and advanced topics on panel data and binary dependent variables.

Course Structure

This course is designed to provide a hybrid experience, including both face-to-face and online activities.

Contact time will be divided in the following way:

90% face-to-face

10% online

Online sessions will be a blend of self-paced and group activities using Canvas. Activities will consist of reading, voiceover PowerPoint lectures, online quizzes, discussion forums, and email.

Face-to-face sessions will be held on the San Jose State campus in DMH 348 on Mondays and Wednesdays.

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

- Learn basic econometric techniques and their applications to business and economics.
- Understand how to postulate and test hypotheses related to economic issues or problems.
- Develop the tools necessary to conduct empirical work in business and economics.
- Build experience in estimating economic models with econometric modeling software.
- Use programming language R to estimate regressions.
- Analyze the strengths and weaknesses of the basic regression model.
- communicate clearly and effectively in writing, and learn to relate econometric techniques to written arguments.
- Apply econometric techniques to economic theory and real-world problems.

Required Texts/Readings

Textbook

Stock, J.H. & Watson, M.W. 2011. Introduction to Econometrics. Pearson 3rd ed.

Other Readings

Christian Kleiber & Achim Zeileis, 2008, Applied Econometrics with R, Springer, 1st ed.

Course Requirements and Assignments

Bi-Weekly Homework:

There will be problem sets every other week, each of which involves empirical analysis. The data for the problem sets will be posted on Canvas. Please hand in homework assignments before class on the day they are due. Assignments handed in after this, but before answers are distributed (typically two days later) will be marked down by 50%. Assignments handed in after answers are distributed will receive no credit.

Students are encouraged to work with others in the class on their problem sets, but each student must write up his or her answers separately. **The maximum group size is 3.** Please list the name(s) of those with whom you worked on your assignment.

Term Paper/Project: 20%

The purpose of this project is to provide an opportunity to formulate an economic model, estimate the model with appropriate data, and interpret the results. This experience will help you understand how econometrics relates to other economics courses which focus on theoretical models for how the world operates. Econometrics provides a method of testing the validity of these economic models. Additionally, the term paper will improve your writing skills and give you a chance to write clearly and concisely about technical material.

This project will involve replicating the analysis presented in an empirical paper, and possibly presenting further analyses of the data set used in the paper. As an alternative, you may use a data set of your own choosing and carry out an original analysis, using your own research. A major goal of this exercise is organization and presentation of a carefully written report. Prior to starting the project, you will submit a brief (not more than one page) project proposal for my review. **This proposal is required.**

Collaboration on term project is encouraged. **The maximum group size is 2. The project results must be presented in a poster on Nov 28.**

The top three posters that receive most favorable votes will be awarded with extra credits, an opportunity to compete for department research scholarship and to present your work at a conference.

Paper structure

I. Title page.

II. Abstract. This should be less than 50 words and summarize the topic, methodology, and main findings. It should appear on your title page.

III. Introduction. This section should state the nature and objectives of the project along with a brief review of any relevant literature. Make sure to provide some background or motivation for why your project is interesting.

IV. Description of the model. The model should be clearly stated and any equations carefully explained. You should write out the econometric model you plan to estimate, and discuss the expected impact of the exogenous variables in your model.

V. Data description and model estimation. You should use the techniques developed in class to analyze your data and estimate your model. Make sure to describe the dataset you are using by providing summary statistics of important variables. Your results should be reported and discussed in this section and could include:

parameter estimates, standard errors, t-statistics, F-statistics, R^2 , tests for autocorrelation, heteroskedasticity, and possible multicollinearity, as appropriate.

VI. Conclusion. Review the major findings as well as possible extensions for future work. Make sure to mention any limitations of your approach as well as alternative explanations of your results. Policy implications, if any, could also be included in this section.

VII. Tables and graphs. Your paper must include at least one table and one graph. The tables and graphs should be well-labeled and accessible to the reader—do not merely print out your regression output with cryptic variable names.

Appendix If you have a lot of regression results or other details in your theoretical/statistical model that merit to be included yet, they may distract the reader, you may include them in an appendix.

Preliminary Assignments

There are three assignments leading up to the final draft of your paper, which is due on **December 3, 2018**.

Assignment #1: Due at the beginning of class on **October 8, 2018**. Write up a one to two page memo which motivates why the topic you have chosen might be interesting. Find at least one article (from a newspaper, academic journal, or popular periodical) that may be used as support or motivation for your topic. Briefly refer to this article in your memo. Late assignments will not be accepted.

Assignment #2: Due at the beginning of class on **Oct 22, 2018**. Collect your data and create a table with summary statistics of the variables you plan to use in your project. In one to two pages, describe the variables you are using and highlight any interesting numbers from your table of summary statistics. Late assignments will not be accepted.

Assignment #3: Due at the beginning of class on **November 14, 2018**. Turn in a rough draft. While your paper does not have to be complete, you should at least describe your model and have some preliminary results. Late assignments will not be accepted.

Assignment #4: Due on **November 28, 2018**. Present the project results in a poster session. Your presentation and slides will be evaluated by your peers and me.

Assignment #5: Due at the beginning of class on **December 3, 2018**. Turn in the final draft of your paper on Canvas.

Online Lab:

The lab is 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. Examples covered in the lab are similar to weekly homework assignments.

Exams: 50%

There are two midterm exams (in-class) and one final comprehensive exam (online). Students are not allowed the use of any aids on the midterms, although they may use a one-sided cheat sheet during the final. All of these exams will be multiple choice exams. One-third of the questions will be similar to the Practice Quiz questions found here: http://wps.aw.com/aw_stock_ie_3. Another third of the exam questions will be multiple choice questions based on the bi-weekly homework assignments. The final third will be based on lecture notes.

The final exam will be an online exam using LockDown Browser and a webcam (Respondus Monitor).

1. This course requires the use of LockDown Browser and a webcam for online exams. The webcam can be built into your computer or can be the type that plugs in with a USB cable. Watch this short [video](#) to get a basic understanding of LockDown Browser and the webcam feature.
2. You can download and install Lock Down Browser and Respondus when you are going to take a practice quiz on Canvas.
3. Note: Don't download a copy of LockDown Browser from elsewhere on the Internet; those versions won't work at our institution.
4. To take an online test, start LockDown Browser and navigate to the exam. (You won't be able to access the exam with a standard web browser.)
5. Finally, when taking an online exam, follow these guidelines:
 - Ensure you're in a location where you won't be interrupted
 - Turn off all mobile devices, phones, etc.
 - Clear your desk of all external materials — books, papers, other computers, or devices
 - Remain at your desk or workstation for the duration of the test
 - If a webcam is required, make sure it is plugged in or enabled before starting LockDown Browser
 - LockDown Browser will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted
 - If a webcam is required, you will be recorded during the test to ensure you're using only permitted resources

Grading Information

There will be two midterm exams, a comprehensive final, homework assignments and a term paper.

Final grades will be determined as follows:

<u>Assignment</u>	<u>%</u>	<u>Due Dates</u>
Homework assignments (lowest HW dropped)	30%	Every two weeks
Midterm 1	15%	10/1
Midterm 2	15%	11/7
Comprehensive Final	20%	12/12, online, 12:15 pm to 2:30 pm
Term Paper	20%	12/3, due on Canvas

Classroom Protocol

In consideration to your classmates and me, be on time, stay for the duration of the class and avoid any disruptive activities within the classroom (cell phones, side conversation, newspaper reading, etc.)

University Policies

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](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the current academic year calendars document on the [Academic Calendars webpage](http://www.sjsu.edu/provost/services/academic_calendars/) at http://www.sjsu.edu/provost/services/academic_calendars/. The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/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](http://www.sjsu.edu/advising/) 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), <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.”
 - It is suggested that the greensheet include the instructor's process for granting permission, whether in writing or orally and whether for the whole semester or on a class by class basis.
 - In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.
- “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 Academic Integrity Policy S07-2](http://www.sjsu.edu/senate/docs/S07-2.pdf) at <http://www.sjsu.edu/senate/docs/S07-2.pdf> 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](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

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 Integrity 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.

In 2013, the Disability Resource Center changed its name to be known as the Accessible Education Center, to incorporate a philosophy of accessible education for students with disabilities. The new name change reflects the broad scope of attention and support to SJSU students with disabilities and the University's continued advocacy and commitment to increasing accessibility and inclusivity on campus.

ECON 103 / Intro to Econometrics, Fall, Course Schedule

Course Schedule

Week	Dates	Topics, Readings, Assignments, Deadlines
1	8/22	Introduction
2	8/27	Review of basic probability and statistics concepts, chp 2, 3
2	8/29	Review of Basic Probability and Statistics Concepts, chp 2, 3,
3	9/3	Labor Day
3	9/5	Linear regression with one regressor, chp 4
4	9/10	Linear regression with one regressor, chp 4 HW 1 due
4	9/12	Linear regression in R
5	9/17	Inference, chp 5
5	9/19	Inference, chp 5
6	9/24	OLS Assumptions HW 2 due
6	9/26	Review
7	10/1	Midterm 1
7	10/3	Heteroscedasticity and Linear Regression with multiple regressors, chp 6 -7
8	10/8	Linear Regression with multiple regressors in R, chp 6-7 Memo due
8	10/10	Perfect Multicollinearity and Categorical Independent Variables, chp 6-7

Week	Dates	Topics, Readings, Assignments, Deadlines
9	10/15	Joint Hypothesis Testing, chp 7 HW 3 due
9	10/17	Model assessment, chp 9,
10	10/22	Model assessment, chp 9 Data and summary statistics due
10	10/24	Non-linear Regression
11	10/29	Non-linear Regression HW 4 due
11	10/31	Non-linear Regression in R
12	11/5	Review
12	11/7	Midterm 2
13	11/12	Veterans Day
13	11/14	Binary Dependent Variable, chp 11 First draft due
14	11/19	Binary Dependent Variable HW 5 due
14	11/21	Binary Dependent Variable in R, Online
15	11/26	Panel, chp 10
15	11/28	Student presentation
16	12/3	Panel, chp 10 Term paper due
16	12/5	Panel, chp 10
17	12/10	Review HW 6 due
Final exam	12/12	Online, 12:15 pm to 2:30 pm