Department of Economics
University of Southern California

Course:	**ECONOMICS 513,** *Practice of Econometrics*
	Sections 26185D and 26169D

Units:	4
Term—Day—Time:	Fall 2024, Mon, Wed 4:00-5:20 pm.
Location:	LVL-17

Instructor:	Manochehr Rashidian
Office Hours:	2:00-3:30 Mon, Wed KAP-116B
	I am also available by appointment.

Contact Info:	rashidia@usc.edu

Teaching Assistant:	Hai Zhou
Office Hours:	TBD
Contact Info:	haizhou@usc.edu

Course Description and Overview

Econometrics is about quantifying economic relationships using mathematical methods and statistical inference. It involves using economic data to reveal economic relationships. Econometrics techniques have been increasingly used in macroeconomics and applied microeconomics. Macroeconomic data is used to test for theories, evaluate the impacts of public policies, estimate economic relationships, and forecast economic variables such as inflation rate, GDP growth rate, and interest rate. Applying econometrics techniques in microeconomics involves estimating demand, cost, and profit relationships. It also involves testing for underlying microeconomics theories and evaluating and forecasting the impacts of business decisions.

After briefly reviewing probability theory and statistics, we will start with simple and multiple linear regression models. The main focus of the first part will be on assumptions of linear regression, estimation, interpretation of the parameter estimates and the goodness of fit measures, and testing for parameter restrictions. I will present some of the necessary statistical theories for this part in class, but you can also find the topics in any of the following recommended introductory books:

Wooldridge, Jeffrey, Introductory Econometrics, a Modern Approach (5th or newer edition) *
Damodar Gujarati, Econometrics by Examples (2nd edition)*
Stock, and Watson, *Introduction to Econometrics.*
Hill, C., W. Griffiths, and G. Judge. Undergraduate Econometrics.
Ramanathan, Ramu, Introductory Econometrics with Applications.

In the second part of the course, we will explore more advanced econometric models and estimation techniques. This section will cover discrete choice models, models with limited dependent variables, multiple equation systems, and panel data analysis. We will also examine various estimation methods, including nonlinear least squares, maximum likelihood, the generalized method of moments, and nonparametric regression. I will provide a brief overview of the theoretical concepts during lectures, while more detailed explanations can be found in your reference textbooks and my notes.

My lecture will be mostly on the estimation and interpretation of the results. For a more detailed explanation of the theory and a wide range of references, you should rely on any of the following more advanced textbooks:

Greene W, H. Econometric Analysis (7th edition)*
Wooldridge, Jeffrey Econometric Analysis of Cross Section and Panel Data*
Maddala G, S. Econometrics

Learning Objectives

This course aims to provide the students with comprehensive knowledge of widely used econometrics models and estimation methods. After completing this course, students should be able to perform data collection tasks, model econometrics relationships, estimate and test the model, and interpret and use the estimation results for prediction and policy evaluation.

Course Notes
1- Students should come to class on time to prevent lecture disruptions.
2- Attending the lectures is crucial to your learning, and I strongly encourage students to attend the lectures and participate in class discussions. Missing lectures can impact your standing in the class.
4- Lecture notes, whenever available, will be posted on the Brightspace.
5- I will post the solutions for all homework assignments and exams on Brightspace.
6- You should check your grades on the Brightspace regularly, and if you see any discrepancies, inform the instructor or your TA immediately.
7- If deteriorating COVID conditions force the university to move online, we will use Zoom for lectures and office hours and Brightspace for exams and homework assignments. If you need help with Zoom or Brightspace, use the following technology support links:

USC Technology Support Links
USC Computing Center Laptop Loaner Program
Zoom information for students
https://www.brightspacehelp.usc.edu/

Computer Software Information

If you are familiar with any well-known econometrics software such as SAS, STATA, EVIEWS, SPSS, PYTHON, or R, you may use it for your assignments and classwork. Most of these programs and their instructions are available on the USC network.
Software available to USC Campus

I will use the STATA program for our class demonstrations. If you prefer to have a copy of the STATA software, the student version (STATA/BE) is available on the STATA website: http://www.stata.com/order/new/edu/gradplans/student-pricing/#

Description and Assessment of Assignments and Exams

The homework assignments and their due dates will be posted on the Brightspace. You must submit your homework assignments on time (and preferably typewritten). In addition, for all assignments that require statistical software, a computer printout of the estimation results must be attached to the homework. There will be no credit for late homework submitted after posting the solutions on Brightspace. Students must turn in their assignments as instructed by their TA. Please let me know if you need special accommodations to submit your assignment or take the exam.

Students must also participate in a group project (term paper). The project involves data collection, model building, estimation, and results presentation. I will provide more information about the group project and its requirements in class. The group project is due on the final exam day.

We will also have two short exams and a final exam. The short exams are usually during the 5th and 10th weeks of instruction. The exact dates of the short exams will be announced in class at least seven days in advance. The final exam is on **Wednesday, Dec 11th, 4:30-6:30 pm.**

Grading Breakdown

Activity	Percentage of Grade
Assignments	20%
Exam 1	15%
Exam 2	15%
Group Project	20%
Final exam	30%
Total	100%

Attendance

I anticipate regular attendance from my students during lectures and frequently record attendance. Students who consistently attend lectures will receive recognition, and those with excessive absences may be penalized at the semester's end. It is essential for student-athletes and those observing religious holidays to notify me in advance of any scheduled class absences.

Weekly Readings and References

Week	Topics	References
Week 1 8-26, 8-28	Review of basic concepts Random variables and their probability distribution, Joint, marginal, and conditional distributions Review of continuous and discrete distributions	*Wooldridge intro- Appendix B* *Green- Appendix B*
Week 2 9-4	Random sampling and Sampling distribution Review of statistics	*Wooldridge intro- Appendix C* *Green- Appendix C*

	Small and large sample properties of estimators. Review of hypothesis testing and confidence intervals Alternative methods of estimation Introduction to econometrics modeling, the structures of economic data	*Wooldridge intro- chapter 1* *Gujarati- Chapter 1* *Green- Chapter 1*
Week 3 9-9, 9-11	The classical simple linear regression model Assumptions and properties of the simple linear regression model Classical multiple linear regression Least-squares estimation Multiple linear regression assumptions Small sample properties of least square	*Wooldridge intro- Chapter 2* *Wooldridge intro- Chapters 2 and 3* *Gujarati- Chapter 2* *Green- Chapter 2, and 3.1-3.2*
Week 4 9-16, 9-18	Multicollinearity and its Consequences Inference in multiple linear regression Testing multiple restrictions (Wald, LM, and LR)	*Wooldridge intro- Chapter 3* *Gujarati- Chapters 4* *Wooldridge intro- Chapter 4* *Gujarati- Chapter 2* *Green-* 5.1-5.6
Week 5 9-23, 9-25	Econometrics modeling using logarithmic and other functional forms Making predictions	*Wooldridge intro-Chapter 6* *Gujarati- Chapter 2* *Green- Chapter 6*
Week 6 9-30, 10-2	Models with qualitative independent variables Testing for the structural break Linear probability model	*Wooldridge intro-Chapter 7* *Gujarati- Chapter 3* *Green- Chapter 6*

Week 7
10-7, 10-9
	Regression issues
	IV estimation and 2SLS
	     Omitted variables
	     Endogeneity problem
	     Measurement errors
	     Stochastic Regressors
		Wooldridge intro- Chapter 15
		Gujarati- Chapters 5 and 7
		Green- Chapters 8

Week 8 10-14, 10-16	Heteroskedasticity and its Consequences Robust inference Tests of heteroscedasticity	*Wooldridge intro- Chapter 8* *Gujarati- Chapters 5* *Green- Chapters 9*

	Estimation with heteroscedasticity (WLS and FGLS) Generalized regression model	
Week 9 10-21, 10-23	Time series analysis Time series assumptions Trend, seasonality, and spurious regression Serial correlation and properties of OLS Testing for serial correlation, Correcting for serial correlation, FGLS, and iterative FGLS methods Testing and correcting for higher-order serial correlation Robust inference with serial correlation	*Wooldridge intro- Chapters 10* *Gujarati- Chapters 14* *Wooldridge intro- Chapters 12* *Green- Chapter 20*
Week 10 10-28, 10-30	Heteroscedasticity in time series Autoregressive conditional Heteroskedasticity (ARCH and GARCH) models	*Green- Chapter 20* *Gujarati- Chapters 15*
Week 11 11-4, 11-6	System of equations, Seemingly unrelated regression (SUR) system, OLS and GLS estimation of SUR System	*Green- Chapters 10* *Gujarati- Chapters 21* *Woodridge- Chapters 7*
Week 12 11-13	Simultaneous equation models Dealing with the identification problem Single equation estimation of the simultaneous equation model System methods of estimation	*Wooldridge intro- Chapter 16* *Green- Chapters 10* *Woodridge- Chapters 8, 9*
Week 13 11-18, 11-20	Models of panel data, Pooled regression model, Fixed and random-effects models	*Wooldridge intro- Chapter 14* *Gujarati- Chapter 17* *Green- Chapter 11* *Woodridge- Chapter 10*
Week 14 11-25	Binary response models, Logit and Probit models, Discrete choice Models, Multinomial logit models, Limited dependent variable models	*Wooldridge intro- Chapter 17* *Gujarati- Chapters 8, 9, 10* *Woodridge- Chapter 15* *Green- Chapters (17, 18, and 19 applied to panel data. Very advanced treatment)*
Week 15 12-2, 12-4	Nonparametric estimation	*Green- Chapter 20* *Handouts*

Policy on Missed Exams
Students must take the exams as scheduled. There will be make-up exams if the student has a valid medical excuse and can provide documentation for such a reason. If you cannot take an exam because of extenuating circumstances, please let me know as soon as possible. You will receive zero credit for unexcused missed exams. You will receive an F for the course if you miss the final exam, regardless of your performance during the semester. You will receive an incomplete grade if you have a valid reason for missing the final exam and can document it.

Academic Integrity
The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the University's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the USC Student Handbook. All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the University and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the University.

For more information about academic integrity see the student handbook or the Office of Academic Integrity's website, and university policies on Research and Scholarship Misconduct.

Policy for the use of AI Generators in the course
Since creating, analytical, and critical thinking skills are part of the learning outcomes of this course, all assignments should be prepared by the student working individually or in groups. Students may not have another person or entity complete any substantive portion of the assignment. Developing strong competencies in these areas will prepare you for a

competitive workplace. Therefore, using AI-generated tools is prohibited in this course, will be identified as plagiarism, and will be reported to the Office of Academic Integrity.

Course Content Distribution and Synchronous Session Recordings Policies
USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the internet, or via any other media. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Statement on Academic Conduct and Support Systems
Academic Integrity:
The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, compromises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the University's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the University. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the University.

For more information about academic integrity see the student handbook or the Office of Academic Integrity's website, and university policies on Research and Scholarship Misconduct.

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Students and Disability Accommodations:
USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:
Counseling and Mental Health - *(213) 740-9355 – 24/7 on call*
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

988 Suicide and Crisis Lifeline - *988 for both calls and text messages – 24/7 on call*
The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

Relationship and Sexual Violence Prevention Services (RSVP) - *(213) 740-9355(WELL) – 24/7 on call*

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX (EEO-TIX)](#) - *(213) 740-5086*
Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - *(213) 740-5086 or (213) 821-8298*
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services (OSAS)](#) - *(213) 740-0776*
OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - *(213) 740-0411*
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - *(213) 740-2101*
Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - *UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - *UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call*
Non-emergency assistance or information.

[Office of the Ombuds](#) - *(213) 821-9556 (UPC) / (323-442-0382 (HSC)*
A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - *(323) 442-2850 or* otfp@med.usc.edu

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.