

PPD 558 Multivariate Statistical Analysis

Fall 2021 Thursdays 6:00pm – 9:20pm

Course Location: VPD 116

Section 51247D

Instructor: Michael C.Y. Lin, Ph.D.

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TA Office Hours: Wednesdays, 11 am – 12:30 pm (via Zoom) or by appointment

Access to Course Materials: Blackboard (<http://blackboard.usc.edu>)

COURSE DESCRIPTION

This course will provide you with the analytical skills required to conduct applied quantitative research. It will also teach you to think critically about methodology and proper interpretation of results when analyzing and reading empirical research such as that found in journals, white papers, and policy papers from both academia and industries.

The foundation of this course is multivariate regression analysis. We will begin by learning Ordinary Least Squares (OLS) models and then expand our coverage to logistic models, experimental methods, and panel data to evaluate the impact of public policies. We will discuss common problems with these methods, techniques for diagnosing and addressing these problems, and selection of the appropriate econometric tools to answer any given question.

Prerequisite(s): Applied Social Science Statistics (PPD570 or equivalent)

COURSE OBJECTIVES

The goal of this course is to train students to be effective practitioners and sophisticated consumers of quantitative research methods for policy analysis. While we will use econometric theory, it is a means to an end: this course has a strong applied (rather than theoretical) orientation, so coverage of econometric theory will be limited to those elements that directly serve the primary goal of enabling students to be successful users of quantitative empirical analysis.

This goal will be achieved through lectures, discussions, student presentations and activities, problem sets, take-home exams, and completion of a final paper. Through successful completion of the course, students will be able to:

- Identify relevant empirical research questions/problems.
- Collect and clean data.
- Understand and apply quantitative and evidence-based econometric techniques to conduct policy analysis to address complex policy, management, and planning problems.
- Think critically about methodologies when analyzing their own projects or reading empirical research such as that found in academic journals, white papers, and policy papers.
- Conduct analysis and interpret results, and make policy recommendations.
- Write professional research report.
- Present and discuss empirical analyses effectively.
- Apply leadership skills as well as team collaboration skills.

REQUIRED READINGS AND SUPPLEMENTARY MATERIALS

Required and optional readings are noted as such.

Required

- Studenmund, A.H. (2017). *Using Econometrics: A Practical Guide* (7th Edition), Boston: Pearson.

-Textbook resources website:

https://media.pearsoncmg.com/ph/bp/bp_studenmund_econometrics_7/index.html

-Stata companion:

https://media.pearsoncmg.com/ph/bp/bp_studenmund_econometrics_7/Using_Stata/UsingStata.html

Note: The 6th edition of the Studenmund text can be used instead (successful completion of the course does not require the newest edition), but the 7th edition has incorporated some substantial revisions. Pay attention to chapter topics not just number as these sometimes change across editions.

Optional

- Acock, Alan C. (2018). *A Gentle Introduction to Stata* (Sixth Edition), College Station: Stata Press. (This book covers Stata basics and some foundational topics from this course.)

•There are also many free online resources for learning how to use Stata that you may find to be helpful. For example, UCLA's stats group provides tutorials at <https://stats.idre.ucla.edu/>

For Ph.D. Students, I recommend more advanced readings from:

- Angrist, Joshua D. and Jörn-Steffen Pischke (2009). *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton: Princeton University Press.

•Cameron, A. Colin and Pravin K. Trivedi (2010). *Microeconometrics Using Stata* (Revised Edition). College Station: Stata Press.

•Khandker, Shahidur R., Gayatri B.Koolwal, and Hussain A. Samad (2010). *Handbook on Impact Evaluation: Quantitative Methods and Practices*. Washington D.C.: World Bank. (Free PDF version at <https://openknowledge.worldbank.org/handle/10986/2693>. This book provides more advanced coverage of post-midterm topics such as experimental methods and difference-in-difference, and also provides a useful reference for students looking to learn about material beyond that covered in PPD 558, such as propensity score matching and regression discontinuity methods.)

You may also be asked to read various journal articles as noted in the syllabus that will be made available on Blackboard.

SOFTWARE/HARDWARE REQUIRED

All students should have Stata installed on their computers before our first class.

Stata

The Stata software package is required for in-class data analysis, take-home assignments, and final project. There are several different versions of Stata available. The required version of Stata is Stata/BE 17 (For mid-sized datasets). If you are going to use Stata just for this course, you may choose to purchase the license for 6-month use. Go to <https://www.stata.com/order/new/edu/gradplans/student-pricing/> for more information.

COURSE DELIVERY AND SCHEDULE

Our weekly meetings comprise lectures and in-class activities. To maximize the learning opportunities during the synchronous portion of our class time, students are expected to study/review lecture handouts, go over assigned readings, and prepare their questions. Class time may also be used for the application of the topic through activities such as practice problems and Stata exercises.

Chatting things unrelated to the course materials is not allowed during our classes. This creates a distraction not only for those do so but also for other students, which is particularly detrimental in a class that is challenging to begin with.

The table below provides the weekly topics/activities, readings, and assignments due date (due by beginning of class unless otherwise specified).

Week 1 (Aug. 26) – Course Introduction & Statistical Principles	
Studenmund (6E) Ch. 17 (available here)	
Week 2 (Sept. 2) – Regression Analysis: Estimation and Evaluation	
Studenmund Ch. 1-3, 5	
Week 3 (Sept. 9) – Regression Analysis: Assumptions, Properties, and Model Specification	
Studenmund Ch. 4, 6-7 <u>Optional:</u> •Graddy, Elizabeth (2001), “Juries and Unpredictability in Products Liability Damage Awards,” <i>Law & Policy</i> , 23:1, 29-45.	Project Groups Due
Week 4 (Sept. 16) – Multicollinearity and Introduction to Data Sets	
Studenmund Ch. 8	Problem Set 1 Due
Week 5 (Sept. 23) – Serial Correlation and Heteroskedasticity	
Studenmund Ch. 9-10	Problem Set 2 Due
Week 6 (Sept. 30) – Regression Analysis in Practice & Midterm Review	
Studenmund Ch. 11	Problem Set 3 Due Project Proposal Due
Week 7 (Oct. 7) – Midterm Examination	
Week 8 (Oct. 14) – Fall Recess	
Week 9 (Oct. 21) – Categorical Dependent Variable Models	
Studenmund Ch. 13 <u>Optional:</u> •Aguila, Emma, and Julie Zissimopoulos (2013), “Retirement and Health Benefits for Mexican Migrant Workers Returning from the United States,” <i>International Social Security Review</i> , 66:2, 101-125.	Project Data and Methods Due

<ul style="list-style-type: none"> •Graddy, Elizabeth A., and Ke Ye (2008), "When Do We 'Just Say No'? Policy Termination Decisions in Local Hospital Services," <i>Policy Studies Journal</i>, 36:2, 219-242. 	
Week 10 (Oct. 28) – Group Project Work	
Week 11 (Nov. 4) – Experimental Methods	
Studenmund Ch. 16 (through p. 472) <u>Optional:</u> <ul style="list-style-type: none"> •Angrist & Pischke Ch. 2 •Boarnet, Marlon G. (2001), "Enterprise Zones and Job Creation: Linking Evaluation and Practice," <i>Economic Development Quarterly</i>, 15:3, 242-254. •Khandker, Koolwal, and Samad Ch.3 and 5 	Problem Set 4 Due
Week 12 (Nov. 11) – Panel Data and Fixed Effects	
Studenmund Ch. 16 (from p. 473) <u>Optional:</u> <ul style="list-style-type: none"> •Angrist & Pischke Ch. 5 •Joyce, Geoffrey F., Julie Zissimopoulos, and Dana P. Goldman (2013), "Digesting the Doughnut Hole," <i>Journal of Health Economics</i>, 32:6, 1345-1355. •King, Andrew A., and Michael J. Lenox (2001), "Does It Really Pay to be Green? An Empirical Study of Firm Environmental and Financial Performance," <i>Journal of Industrial Ecology</i>, 5:1, 105-116. 	Project Results Due
Week 13 (Nov. 18) – Group Project Work	Problem Set 5 Due
Week 14 (Nov. 25) – Thanksgiving Holiday	
Week 15 (Dec. 2) – Review class	Final Project Paper Due Group Evaluations Due
Week 16 (Dec. 9) – Final Exam	

GRADES AND ASSIGNMENT SUBMISSION POLICY

Students will complete 5 problem sets, a take-home midterm exam and final exam, and an analysis project. Overall scores for the course will be calculated from these components using the weights specified below.

Category	% of Grade
Problem Sets (5% each)	25
Midterm Exam	25
Analysis Project	20
Final Exam	30
TOTAL	100

Grading Scale

93-100	A	73-76	C
90-92	A-	70-72	C-
87-89	B+	67-69	D+
83-86	B	63-66	D
80-82	B-	60-62	D-
77-79	C+	< 60	F

Students are expected to complete all assignments on time. The due dates for all problem sets and the final project are given in the syllabus and must be turned in on the due date BEFORE the start of class using Turnitin assignments via Blackboard. Late assignments will incur a penalty of 10% if submitted late but still on the due date, 20% if submitted the following day, and 30% if submitted the day after that; after this point, the assignment will no longer be accepted. The deadline of submitting exams will be announced before they take place.

This course uses an applied approach that integrates lecture material with hands-on in-class analysis and discussion. Students are expected to attend all class meetings and participate fully in class activities. Because attending all class meetings and completing all in-class work is the minimum expected of all students, class participation is not included directly in the grading breakdown above; instead, a student's overall score in the course may be increased or decreased by up to 3 percentage points to reflect particularly outstanding contributions to class discussions or failure to meet these expectations. In extreme cases, repeated unexcused absences (including missing classes in their entirety and/or in large parts by arriving late and/or leaving early) will result in a non-passing grade for the course regardless of performance on other assignments.

Problem Sets

Students will be asked to complete 5 problem sets that will be made available on Blackboard. You can work on problem sets in groups of 2 or 3. Nonetheless, each person must turn in his/her own problem set written in his/her own words.

Midterm and Final Exams

More details will be announced.

Analysis Project

See the Guidance for Analysis Project for more details.

STATEMENT ON ACADEMIC CONDUCT AND SUPPORT SYSTEMS

Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards and Appropriate Sanctions” policy.usc.edu/scampus-part-b.

Support Systems

The Office of Student Accessibility Services - (213) 740-0776

<https://osas.usc.edu/>

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call

dps.usc.edu

Non-emergency assistance or information.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

dps.usc.edu, emergency.usc.edu

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.