USC Price
Sol Price School of Public Policy

PPD 570: Applied Statistics for Planning, Policy, and Management
Fall 2022 Mondays 6:00pm – 9:20pm
Course Location: VPD 116
Section 51352D

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

COURSE OVERVIEW

This is a first course in statistics for new graduate students with no substantive prior exposure to the field, or for students who want to review the fundamentals. The course is designed and delivered especially for USC Price School IPPAM students. We will cover the fundamentals of probability and statistics, and then treat more ambitious topics.

Our weekly meetings comprise lectures, in-class activities, and computer labs.The lecture meetings will summarize and organize the ideas put forth in the readings, and will necessarily emphasize basic theory and procedures. There will be numerous applied examples. Students will learn the use of statistical reasoning to answer questions related to public policy and management. Students will review and understand selected statistical techniques for analyzing data and for addressing public policy and management questions of interest using applied data analysis. Computer labs will equip students with the ability to use statistical programs to process and analyze data and interpret results based on the theories they have learned from lectures.

We have only a very limited amount of time to cover this quantity of material, and routine attendance is strongly encouraged. As a matter of courtesy to all parties concerned, please arrive on time, and discuss any premature departures with me prior to the event. If you come late, please be careful not to slam the door as you enter. If you do skip a class, the cost of any mitigation is yours, not mine.

I will communicate with you at your USC NetID, which is also your USC email address. You are accountable for the information content of the messages I send to you. I will also post key messages as announcements on the course blackboard website, which you also access with your USCNetID. My email address is above.

LEARNING OBJECTIVES

This class is designed to provide you with:

•a basic understanding of probabilistic and statistical concepts, with an emphasis on probability;
•an ability to reason in probabilistic terms;
•a set of accepted techniques that can be used to analyze, understand, and (hopefully) address many public policy and management problems and related research questions; and the means to acquire new skills in this dimension as needed;
•an understanding of how to ask statistical questions, and how to treat the information needed to answer these questions or offered in response to these questions;
•a basic familiarity with statistical computing standards; and
•an understanding of why statistical analysis is a key element of your applied social science graduate education, regardless of whether your objectives are further scholarship or further professional practice.

COMPUTING AND THE COMPUTER LAB

Modern statistical procedures were revolutionized by the availability of low-cost computers, just as computing has revolutionized just about everything else. The main objective of the lab sessions is to provide you with hands-on opportunities to apply what you have learned in the lectures of statistics with computer packages – RStudio, Microsoft Excel (MS Excel), and Tableau. RStudio is a powerful statistical software package that has become widely used in various fields and around the world. Although the major statistical program you will learn is RStudio, you will also learn how to use MS Excel (a widely-used spreadsheet software program) and Tableau (a popular business intelligence (BI) / data visualization tool). You will also learn how to interpret the results from program outputs.

RStudio

RStudio is an integrated development environment (IDE) that makes R more user-friendly. For this course, although you can download RStudio on your laptop, I highly recommend you to use RStudio Cloud. Both versions can be downloaded at no cost from https://www.rstudio.com/. Nonetheless, to install RStudio, you have to firstly install R. You can download R for free at https://www.r-project.org/.

The demonstrations in lab will be based on Windows operating system. Those who use RStudio on Mac may find some R code introduced by the instructor would not work. When encountering this situation, you may need to search for solutions online.

REQUIRED READINGS AND SUPPLEMENTARY MATERIALS

Required and optional readings for both lectures and labs are noted as such.

Lectures

•Required: Illowsky, Barbara *et al.* (2018). *Introductory Statistics*. Houston: OpenStax.
(This book is available at https://openstax.org/details/books/introductory-statistics.)
•You may also be asked to read supplementary material as noted in the syllabus that will be made available on Blackboard. Assigned readings are important and will contribute significantly to your understanding of the lecture material. The first-best strategy is to skim the assigned material before class, attend lecture, listen carefully, and then read the text assignments with discrimination.

Labs

•There are no required texts for the lab sessions. You will use lab notes provided by me. All lab notes and readings can be downloaded via the course website: https://blackboard.usc.edu/.

COURSE ASSESSMENT & EVALUATION

Objective measures include class participation (10%, so make the most of it and speak up with questions and other contributions to class discussion), homework exercises (25%, for which you may work together and receive copious assistance), lab participation and assignments (15%), a midterm examination (20%, in class), and a final examination (20%, take home to be worked alone). You may turn the final examination in ahead of schedule, but not after the due date.

These weights add up to 90%. An additional 10% will be added to the weight for that objective course component accounting for each student's best performance. There are many ways for a student to turn in a performance that reflects knowledge lower than his or her true state of information, but relatively few ways for a student to deliver a performance reflecting a better state of information than the state he or she actually has achieved. Consequently, I place a premium on the importance of each student's best score because this score includes more information than his or her lower scores.

Course Component	Weight
Homework: Average of 5	25%
Class Participation	10%
Lab Assignments	15%
Midterm Exam	20%
Final Examination Dec 16	20%
Floating Increment	10%
Total	100%

Cooperation is almost always the least expensive means of overcoming difficulty, so I urge students to work homework assignments in teams. You are strongly encouraged but not required to execute homework assignments in teams of two to four members. Team members will receive identical grades on group assignments. Students worked in groups may be asked to do peer evaluations. If you have not contributed to the completion of a homework assignment, please do not pester your colleagues to fraudulently append your name to their work. This would be a violation of University Conduct Code § 11.15, 11.17, 11.21, and 11.31. See the information below on academic integrity.

Homework assignments will be distributed via blackboard and are due on the schedule indicated. All homework should be submitted electronically via the course website. Once you self-select your groups I will set these up in blackboard and you will make a single submission for each group. Please do not submit homework assignments as multiple documents or files. Integrate you work for each assignment into as single Word document (not a PDF file). Keep an electronic copy of your submissions for your records, in any event. Class members should respect this schedule. Late work will normally be declined.

The midterm and final examinations must be completed alone.

The university permits grades of "incomplete (IN)" to be given only if the terms the University defines for issuing a grade of "incomplete" are met. See SCampus, https://policy.usc.edu/student/scampus/, the USC Student Handbook, for the conditions under which students might legitimately request a grade of "incomplete," and under which an instructor might legitimately accommodate such a request.

COURSE SCHEDULE

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

Week 1 (Aug. 22) – Course Intro, Basic Concepts, Data Visualization & Lab 1: R Intro I	
Illowsky *et al.*, pp. 5-100	
Week 2 (Aug. 29) – Measures of Central Tendency, Measures of Variability, Probability & Lab 2: R Intro II	
Illowsky *et al.*, pp. 100-241	
Week 3 (Sept. 5) – Labor Day	
	Problem Set 1 Due
Week 4 (Sept. 12) – Discrete Random Variables, Continuous Random Variables & Lab 3: Data Preparation	
Illowsky *et al.*, pp. 243-364	
Week 5 (Sept. 19) – The Normal Distribution, The Central Limit Theorem & Lab 4: Data Exploration	
Illowsky *et al.*, pp. 365 - 442	
Week 6 (Sept. 26) – Confience Intervals & Lab 5: Data Wragling	
Illowsky *et al.*, pp. 443 - 504	
Week 7 (Oct. 3) – & Midtern Review	
	Problem Set 2 Due
Week 8 (Oct. 10) – Midterm Examination	
Week 9 (Oct. 17) – Hypothesis Testing with One Sample & Lab 6: Data Visualizaion	
Illowsky *et al.*, pp. 505 - 565	
Week 10 (Oct. 24) – Hypothesis Testing with Two Samples & Lab 7: Descriptive Statistics	
Illowsky *et al.*, pp. 567 - 620	
Week 11 (Oct. 31) –The Chi-square Distribution & Lab 8: MS Excel and Tableau I	
Illowsky *et al.*, pp. 621 - 678	Problem Set 3 Due
Week 12 (Nov. 7) – F Distribution and One-Way ANOVA & Lab 9: MS Excel and Tableau II	
Illowsky *et al.*, pp. 743 - 783	

Week 13 (Nov. 14) – Correlation, Simple Regression Analysis & Lab 10 – Correlation & Regression Analysis I (Simple Regression)	Problem Set 4 Due
Illowsky *et al.*, pp. 679 - 742	
Week 14 (Nov. 21) – Multiple Regression Analysis & Lab 11 – Regression Analysis II (Multiple Regression)	
https://www.stat.berkeley.edu/~brill/Stat131a/29_multi.pdf	
Week 15 (Nov. 28) – Lab 12: Regression Analysis III (Multiple Regression Issues) & Final Review	
	Problem Set 5 Due
Week 16 (Dec. 12) – Final Exam	

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," https://policy.usc.edu/scampus-part-b/. Other forms of academic dishonesty are equally unacceptable. See additional information in USC Scientific Integrity, https://ooc.usc.edu/research-compliance/scientific-integrity/.

The Sol Price School of Public Policy adheres to the University of Southern California's policies and procedures governing academic integrity as described in SCampus. Students are expected to be aware of and to observe the academic integrity standards described there, and should expect those standards to be enforced in PPD 570, because they will be.

Support Systems

988 Suicide & Crisis Lifeline - 1 (800) 273-8255 – 24/7 on call
https://suicidepreventionlifeline.org. Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

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

Diversity, Equity and Inclusion at USC - (213) 740-2101 - https://diversity.usc.edu/
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.

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086
https://eeotix.usc.edu/. 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.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press "0" after hours – 24/7 on call
https://studenthealth.usc.edu/sexual-assault. Free and confidential workshops, therapy services, and training for situations related to gender-based harm.

The Office of Student Accessibility Services (OSAS)- (213) 740-0776 - https://osas.usc.edu/
OASA is responsible for ensuring equal access for students with disabilities in compliance with state and federal law. 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. OSAS serves undergraduate, graduate and professional students; on-ground and on-line students; and students in all credit-granting courses and programs of study.

USC Campus Support and Intervention - (213) 821-4710
https://campussupport.usc.edu. Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call.
https://dps.usc.edu/ Non-emergency assistance or information.

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

Academic Research and Writing Support

USC Libraries Tutorials
The library web page provides useful information and video tutorials on academic dishonesty: citing sources and understanding plagiarism, evaluating sources of information, crafting a good research question, digital library search strategies, customizing Google Scholar, downloading images for personal use without violating copyright law, and other topics. Visit https://libraries.usc.edu/tutorials.

Information about government documents, legislation, regulations, reports and data can be found by exploring the resources at this link: https://libguides.usc.edu/govdocs.

Library for International and Public Affairs (LIPA) Workshops
The library normally offers workshops and other programming on finding and using data, visualization, tools, software, using government documents, and accessing public policy and public affairs journals. See https://libraries.usc.edu/lipa/workshops.

Research guides for other subjects and citation guides can be found at:
https://libguides.usc.edu/?b=s

Research guides for policy and planning can be found at: https://libguides.usc.edu/PPGA.

In addition, reference consultations through video, chat and email can be scheduled by sending an email to the librarian specializing in public administration, policy and public affairs: Eimmy Solis at eimmysol@usc.edu. Use the Ask-A-Librarian service at https://libraries.usc.edu/ask-a-librarian for general telephone, email, and chat reference assistance or to find information about research help available at other libraries on campus.

USC Writing Center
The Center offers individual consultations on drafts of your papers and workshops on improving writing skills. Please make use of their services when preparing papers and written assignments for your courses. Their website is: https://dornsife.usc.edu/writingcenter/