

PPD 504: Essential Statistics for Public Management (2 Units) – Fall 2021

Tuesdays 6:00 pm – 7:50 pm PT – VPD LL101

Instructor: Pedro Nascimento de Lima | plima@usc.edu

Office Hours: Fridays 3:00 pm – 4:00 pm (Zoom)

Course Assistant: Annie Hong | anniehon@usc.edu

Office Hours: Mondays 4:00 pm – 5:00 pm (Zoom, meeting id 952 4341 7025)

Course Description

This course is designed to introduce students to the foundations of statistical inference. The course will develop the basic statistical skills needed in a world where evidence-based decision making is of primary importance. This course assumes no prior knowledge in statistics or probability and is appropriate to students from a wide range of backgrounds. The course covers descriptive statistics techniques, including measures of central tendency and dispersion. The course also covers commonly used probability distributions, including the normal and binomial distributions. Next, the course covers inference methods using those probability distributions, including hypothesis testing and confidence intervals for means and proportions. Finally, the course introduces students to linear regression methods.

Course Objectives

In this course, students will learn:

- To identify common research design and measurement issues.
- To Interpret and present data and descriptive statistics appropriately.
- To apply common probability distributions to statistical inference problems.
- To formulate and interpret linear regression models.

Required Readings

This course has one required textbook: Meier, Kenneth J., Jeffrey L. Brudney, and John Bohte. *Applied statistics for public and nonprofit administration*. Cengage Learning, 2014. Students are expected to read the assigned chapters before classes.

Evaluation

- Problem sets: 30%
- Midterm: 30%
- Final Exam: 40%

Assignments

Students should submit a hard copy of the assigned problem sets at the beginning of classes, with a 10% grade reduction per day of delay. In case you are not able to attend class, you should make sure that a classmate will print and submit your assignment on your behalf on time. The write-up should present results clearly, be well organized and readable. Poor organization or formatting will be marked down. No late assignments will be accepted unless you have received permission from me before the due date. Problem sets will be posted on the course's [Blackboard site](#).

Exams

There will be an in-class midterm and an in-class final exam (administered during finals week). The final exam is not cumulative. However, the nature of the material is cumulative because inference for linear regression builds on the principles of statistical inference discussed in the first part of the class.

Technology

Students will need a computer with Microsoft Excel for some classes and problem sets. You will benefit from having a computer in class to follow instructions on how to perform certain analyses on Excel. Microsoft Office (including Excel) [is available for all USC students](#).

Course Schedule

Date	Class Description	MBB Chapters*	Problem set due
24-Aug	Introduction to Statistics & Data Collection. This class motivates the course with a discussion of the importance of Statistical analysis for Public administration. We will also discuss measurement issues and how data is created with alternative research designs.	1 - 3	
31-Aug	Descriptive Statistics & Data Visualization. This class covers the basic measures of central tendency, discusses key differences between them and discusses how data can be displayed visually.	4 and 5	
7-Sep	Measures of Dispersion. This class introduces measures of dispersion and approaches to display variation graphically.	6	
14-Sep	Probability Distributions for Inference. This class introduces the normal and binomial distributions, which are essential for inference.	7 and 8	1
21-Sep	Introduction to Inference & Confidence Intervals. This class covers basic concepts surrounding statistical inference for the population mean.	10	2
28-Sep	Hypothesis Testing. Statistical inference tools are widely used to test hypotheses about the real world. This class introduces the procedure and interpretation of hypothesis testing.	11	3
5-Oct	Hypothesis Tests for Proportions & Differences between two groups. A common inference problem consists of estimating the	12 and 13	4

Date	Class Description	MBB Chapters*	Problem set due
	proportions. Another common problem is testing differences between two groups. This class covers methods for those tests.		
12-Oct	Review.		5
19-Oct	Midterm Exam.		
26-Oct	Analysis of Contingency Tables. Nominal and ordinal data often can be described with contingency tables. This class introduces useful techniques for such situations.	14	
2-Nov	Introduction to Regression Analysis. This class introduces the main tool in statistics - the linear regression model.	17	6
9-Nov	Assumptions of Linear Regression. Linear regression models often rely on important assumptions. This class discusses the necessary assumptions for causal inference and discusses which assumptions are usually met in practice.	18	7
16-Nov	Multiple Regression. This class extends the linear regression content to multiple independent variables and discusses how and why regression coefficients change. The class also will discuss omitted variable bias and why more advanced multivariate analysis and causal inference methods are necessary and useful.	20	8
23-Nov	Inference with Multiple Regression Analysis. This class discusses inference in the context of multiple regression and allows students to correctly interpret multiple regression results.	21	9
30-Nov	Review.		10
14-Dec	Final Exam.		

* MBB refers to the course textbook: Meier, Kenneth J., Jeffrey L. Brudney, and John Bohte. *Applied statistics for public and nonprofit administration*. Cengage Learning, 2014. Students are expected to read the assigned chapters before classes.

Datacamp Educational Licenses

A [Datacamp for education](#) group will be available for students interested [in short-duration, skills-focused courses offered by datacamp](#). Datacamp offers many courses on several programming languages and tools, including R, python, SQL, git, shell, Excel, Tableau and Power BI. Free access to these courses is provided for your own benefit. This activity is entirely optional and **does not affect your grade**. I will talk about this optional activity in the classroom, and I can provide guidance about which courses to take given your background and interests. To sign up for this, talk to me after class, and I will add you to the Datacamp group.

Datacamp group link:

<https://app.datacamp.com/groups/essential-statistics-for-public-management/>

Copyright information

This content is protected and may not be shared, uploaded, or distributed. Do not share or post problem sets and exam questions and other materials. [USC policy prohibits the distribution of course materials outside of the learning environment \(SCampus Part B § 11\)](#).

STATEMENT ON ACADEMIC CONDUCT AND SUPPORT SYSTEMS

University Policies on Scientific Misconduct

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 SCampus and university policies on scientific misconduct: <https://policy.usc.edu/research-and-scholarship-misconduct/>.

Support Systems

Student Health Counseling Services

(213) 740-7711 – 24/7 on call – engemannshc.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline

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

Relationship and Sexual Violence Prevention Services (RSVP)

(213) 740-4900 – 24/7 on call – engemannshc.usc.edu/rsvp

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) | Title IX

(213) 740-5086 – equity.usc.edu, titleix.usc.edu

Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

Bias Assessment Response and Support - (213) 740-2421

<http://studentaffairs.usc.edu/bias-assessment-response-support>

Avenue to report incidents of bias, hate crimes, and micro-aggressions for appropriate investigation and response.

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 Support and Advocacy

(213) 821-4710 - studentaffairs.usc.edu/sssa

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion at USC

(213) 740-2101 - 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.

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.

USC Department of Public Safety – UPC

(213) 740-6000, HSC: (323) 442-120 – 24/7 on call

dps.usc.edu. Non-emergency assistance or information.

APPENDIX

ACADEMIC RESPONSIBILITY

Students, faculty, and administrative officials at the University of Southern California, as members of the academic community fulfill a purpose and a responsibility.

The University must, therefore, provide an optimal learning environment, and all members of the University community have a responsibility to provide and maintain an atmosphere of free inquiry and expression. The relationship of the individual to this community involves these principles: Each member has an obligation to respect:

1. THE FUNDAMENTAL HUMAN RIGHTS OF OTHERS
2. THE RIGHTS OF OTHERS BASED UPON THE NATURE OF THE EDUCATIONAL PROCESS
3. THE RIGHTS OF THE INSTITUTION

ACADEMIC DISHONESTY

The following statements and examples explain specific acts of academic dishonesty.

1. Examination Behavior: Any use of external assistance during an exam is considered academically dishonest unless expressly permitted.
 - a. Communicating in any way with another student during the examination.
 - b. Copying material from another student's exam.
 - c. Using unauthorized notes, calculators or other devices.
2. Fabrication: Any intentional falsification or invention of data or citation in an

academic exercise will be considered a violation of academic integrity.

- a. Inventing or altering data for a laboratory experiment or field project.
 - b. Resubmitting returned and corrected academic work under the pretense of grader evaluation error, when, in fact, the work has been altered from its original state.
3. Plagiarism: Plagiarism is the theft and subsequent passing off of another's ideas or words as one's own. If the words or ideas of another are used, acknowledgement of the original source must be made through recognized referencing practice.
- a. Direct Quotation: Any use of a direct quotation should be acknowledged by footnote citation and by either quotation marks or appropriate indentation and spacing.
 - b. Paraphrase: If another's ideas are borrowed in whole or in part and are merely recast in the student's own words, proper acknowledgement must, nonetheless, be made. A footnote or proper internal citation must follow the paraphrase material.
4. Other Types of Academic Dishonesty:
- a. Submitting a paper written by another;
 - b. Using a paper or essay in more than one class without the instructor's express permission;
 - c. Obtaining an advance exam copy without the knowledge or consent of the instructor;
 - d. Changing academic records outside of normal procedures;
 - d. Using another person to complete homework assignment or take-home exam

without the knowledge and consent of the instructor.

The above information is taken directly from *SCampus* and the Academic Affairs Unit of the Student Senate in conjunction with the Academic Standards Committee.

Please refer to *Trojan Integrity: A Faculty Desk Reference*, for more information on assessing sanctions. You may also consult with members of the Office of Student Judicial Affairs and Community Standards at any point in the process, (213) 740-6666

**ACADEMIC DISHONESTY
SANCTION GUIDELINES**

VIOLATION	RECOMMENDED SANCTION (assuming first offense)
Copying answers from other students on exam.	F for course.
One person allowing another to cheat from his/her exam or assignment.	F for course for both persons.
Possessing or using extra material during exam (crib sheets, notes, books, etc.)	F for course.
Continuing to write after exam has ended.	F or zero on exam.
Taking exam from room and later claiming that instructor lost it.	F for course and recommendation for further disciplinary action (possible suspension)
Changing answers after exam has been returned.	F for course and recommendation for disciplinary action (possible suspension).
Fraudulent possession of exam prior administration.	F for course and recommendation for suspension.
Obtaining a copy of an exam or answer key prior to administration.	Suspension or expulsion from the university; F for course.
Having someone else take an exam for oneself.	Suspension or expulsion from the University for both students; F for course.
Plagiarism.	F for the course.
Submission of purchased term papers or papers done by others	F for course and recommendation for disciplinary action (possible

	suspension).
Submission of the same term papers to more than one instructor where no previous approval has been given.	F for both courses.
Unauthorized collaboration on an assignment.	F for the course for both students.
Falsification of information in admission application (including supporting documentation).	Revocation of university admission without opportunity to apply.
Documentary falsification (e.g., petitions and supporting materials medical documentation).	Suspension or expulsion from the university; F for course when related to a specific course.
Plagiarism in a graduate thesis or dissertation.	Expulsion from the university when discovered prior to graduation; revocation of degree when discovered subsequent to graduation.

Please refer to *Trojan Integrity: A Faculty Desk Reference*, for more information on assessing sanctions. You may also consult with members of the Office of Student Judicial Affairs and Community Standards at any point in the process, (213) 740-6666