PPD 504
Essential Statistics for Public Management and Policy

Units 2.0

Term
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Table of Contents

Course Description

This class develops competency in the essential statistics required of public managers and administrators, serving as the graduate level statistical requirement for the MPA at the Price School of Public Policy. The goal of the course is to provide literacy in the use and translation of statistical analysis and reasoning to answer questions related to public administration and management. Students will be able to design feasible approaches to data collection; critique and critically employ secondary data sources; calculate and visually display descriptive measures; and use statistical methods to analyze data and explore statistical trends. The course teaches hypothesis testing including analysis of ordinal and nominal data and provides an introduction to the methods of univariate regression and time series analysis, preparing interested students to take a course in multivariate analysis. The primary goal of the course is to enable students to employ and translate statistical data, and to apply basic statistical methods in addressing public policy and management questions. Unlike many courses in statistical analysis, which focus on business statistics or statistical analysis within a particular social science or scientific discipline, this class enables students to apply statistics specifically for public management analysis. With the emergence and growth of artificial intelligence (AI), the study of data and data analytics would be incomplete without a look at the opportunities and challenges that AI presents. Therefore, the course will also include a running series on the role of artificial intelligence in data analytics.

Course Objective

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

1. Design feasible and valid sampling and data collection approaches, and employ the statistical sources used most frequently by public managers and administrators.
2. Identify threats to internal and external validity in the use of evidence.
3. Calculate and interpret fundamental statistics including measures of central tendency, dispersion, and correlation, specifically as they tend to be applied within public management.
4. Apply essential statistical techniques to summarize and analyze data from secondary sources including hypothesis testing; comparison of means; contingency tables; univariate regression analysis; and time series.
5. Utilize spreadsheet programs and statistical tools, with a particular emphasis on Excel applications, demonstrating proficiency in data manipulation and analysis.
6. Develop skills to become a knowledgeable consumer of information, including the ability to critically evaluate data, identify misinformation and understand how data can be manipulated or distorted.
7. Analyze the significance of artificial intelligence in data analytics, by evaluating its opportunities, identifying potential threats, and formulating strategies to mitigate those threats.

Textbooks & Materials

Required Text:

- Warne, R. (2020). *Statistics for the social sciences: A general linear model approach* (2nd ed.). Cambridge University Press.
- All assigned readings and materials will be available through our course site. For a full list of assigned readings and materials, please see the "Readings and Materials" list at the end of the syllabus.

Supplemental Materials:

- Students need to have access to Microsoft Excel spreadsheet application with the **data analysis** add-in.
- Other supplemental materials will be available through our course site. For a full list of supplemental readings and materials, please see the "Readings and Materials" list at the end of the syllabus.

Grading

Grade Breakdown

Evaluation Category	Assignment/Assessment Name within the Category	Points	Category Weight
Participation	• Live Session Participation (2 scores/4 pts each) (5%) • Individual Discussions (16 activities/5 pts each) (5%) • Concept Check-ins (2 activities/1 pts each as complete/incomplete) (5%)	8 80 12	15%
Homework Assignments	• Baseline Excel Assessment • Measures and Performance in Policing Generating Visual Models • Central Tendency and Variability • Testing Group Differences • Evaluating Nominal Data	50 50 100 100 100 100	20%
Data Visualizations	• Descriptive Statistics • Linear Regression	100 100	15%
Exams	• Midterm Exam • Final Exam	100 100	20% 30%
TOTAL		1000	**100%**

Grading Ranges

Grade	Range
A	Work of excellent quality
B	Work of good quality
C	Minimum passing for graduate credit
D	Failed in courses for graduate credit
F	Failed

Evaluation Categories

Participation

A. Live Session Participation

Students are expected to attend all scheduled live sessions to apply concepts reviewed during the week's assignments. You are responsible for completing all assigned reading and homework assignments and are expected to actively and constructively participate in all class activities. It is expected that you will be fully engaged in what we are doing, that you will make extensive and positive contributions to your own learning and that of others, and that you will be fully supportive of the work of your fellow students.

B. Individual Discussions

As part of this grade, students will complete Discussion Board assignments and TedEx Lessons. For Discussion Boards, students are expected to write thoughtful responses that directly apply to the assignment prompts using course materials (cited) as supporting evidence. Students will post their initial responses to the discussion board prompts by Day 4 of each week. Students will pose follow-up questions to two of their classmates' initial posts by Day 5 (Note: in the interest of ensuring an equitable distribution of follow-up questions, try not to post questions on a classmate's response if two or more students have already posed follow-up questions to that post). Finally, by Day 7 students will post responses to all follow-up questions they received. Failure to post the required number of responses on Days 05 and 07 may result in an additional loss of up to two points. For TedEx Lessons, students will watch a video, engage in asynchronous discussion on the video's main topics, and complete a brief low-stakes comprehension quiz.

Criteria for Discussion Board Initial Postings:

1. Relevance to the topic or problem—Does the posting address the question/s directly?
2. Depth of insight, observation, or analysis—Does the posting offer a concept, idea, new example, or something worthwhile to think about?
3. Use of Evidence and Support—Does the posting seek to make a rational argument supported by documentation instead of merely offering a personal opinion (or does the posting examine personal opinion by way of making a rational argument)?

Criteria for Discussion Board Questions and Responses:

For questions and responses, you should offer something significant to the conversation by either extending or adding to the argument, analysis, or position of the original post or offering an alternative point of view, analysis, or position. Be sure to respond to the prompt with the "discussion" reply formatted as instructed.

Responses will be evaluated for:

1. Number of responses–Did the responses fulfill the minimal requirement for the discussion?
2. Substance of the response–Did the response offer something new or an alternative point of view?
1. Insightfulness–Did the responder offer something to extend or develop a point of view worth thinking about from real world examples or situations? Was this insight worth considering and could it be valuable for other class members?

Discussions Rubric				
Objective/ Criteria	**Incomplete**	**Partially Proficient**	**Proficient**	**Superior**
Relevance, Application, Originality **_/4 points**	Fails to address the question posed, non-serious or not contemplative response, lacks value added information, thought patterns difficult to follow (1)	Addresses the question, some relation to topic, inconsistencies in unity and / or coherence (2)	Addresses the question, uses ideas from project research, adds some content, usually has clear focus (3)	Addresses the question, uses ideas from project research, offers a unique perspective, clear focus, fluent, cohesive (4)

Insight, Observation, Analysis **__/3 points**	No clear concept addressed, lacks clarity of ideas, minimal understanding of the assignment (1)	Posting addresses concepts already highlighted, rudimentary development of ideas, some understanding of the assignment (2)	Posting offers a concept worth thinking about, develops ideas, understanding of assignment (3)	Posting offers significant concept or idea worth thinking about, ideas developed in depth, clear understanding of the assignment (3)
Details/Evidence **__/2 points**	Details are random, inappropriate, or barely apparent (0)	Details lack elaboration or are repetitious (0)	Details are elaborated and pertinent to the course (1)	Details are effective, explicit, and pertinent to the course (2)
Grammar, usage, mechanics **__/1 points**	Errors are frequent and severe (0)	Multiple errors and / or patterns of errors are evident (0)	Some errors are present (1)	Few, if any, errors are present (1)

C. Concept Check-ins

Throughout the semester you will be asked to complete a brief concept check-in to gauge your understanding of the material, and identify areas where you might need additional focus. The Concept Check-in assignments may include conceptual/definitional questions, short answer mathematical questions or reflective open answer questions. They are intended to allow you to see where you may need additional conceptual or computational practice and are the types of questions you may see on the homework and exams.

Homework Assignments

You will have a total of six homework assignments intended to allow you to demonstrate your understanding of the concepts presented in the course. The assignments will require you to complete some mathematical operations, evaluate specific problems and provide written response and analysis. They will utilize case applications in public administration, focusing on the production, interpretation, and translation of statistical concepts from the perspective of a public manager.

Data Visualization Assignments

You will have two data visualization exercises that will require you to develop a one-slide infographic that summarizes statistics you have developed as a part of the assignment in an audience friendly and compelling manner.

Exams

There will be two exams during the semester, a midterm exam and a comprehensive final exam. Exams are open book and open note and will be provided to students on Day One of the week they are assigned. Students will have the entire week to complete the exams.

Homework, Data Visualization Assignment and Exam Rubric				
Objective/ Criteria	**Incomplete**	**Partially Proficient**	**Proficient**	**Superior**
Computational Accuracy **__/60points**	Fails to demonstrate computational understanding. Submittal has excessive errors and lacks clear process (20)	Demonstration of some computational understanding, with errors in calculations (40)	Clearly demonstrated computational understanding, with minor calculation errors (50)	Clearly demonstrates computational understanding with no mistakes (60)

Insight, Observation, Analysis **__/20 points**	Written response shows no clear concept addressed, lacks clarity of ideas, minimal understanding of the assignment (5)	Written response shows limited understanding of concept application, rudimentary development of ideas, some understanding of the assignment (10)	Written response shows general understanding of concepts, develops ideas, understanding of assignment (15)	Written response shows clear understanding of application, with ideas developed in depth, clear understanding of the assignment (20)
Presentation **__/10 points**	Lacks professional quality with obvious errors, lacking organization (0)	Lacks professional quality, some errors, organizational aspects need improvement (0)	Good quality submittal with minor errors in presentation, generally acceptable organization (5)	Well developed submittal with professional quality visual display, very good organization (10)
Grammar, usage, mechanics **__/10 points**	Errors are frequent and severe (0)	Multiple errors and / or patterns of errors are evident (0)	Some errors are present (5)	Few, if any, errors are present (10)

Policies

Weekly Structure

Each day of the week is numbered (please see below). Day 1 is Wednesday, the first day of the beginning of each weekly session.

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Thurs	Fri	Sat	Sun	Mon	Tues	Wed

Due dates for all assignments are stated in day numbers. Assignments are due no later than 11:55 p.m. in the Pacific Time zone on the day that is stated within the assignment page and the weekly activity table.

Submission Protocol

All file submissions (homework assignments, data visualizations and exams) will be handled electronically through submission and return of electronic documents using the portal in Digital Campus. ***No material submitted via email or in hard copy to faculty will be acceptable for grading; however, in the case of electronic submission problems via the LMS, you may provide duplication submissions in a timely fashion to faculty via direct email as a matter of record for your timely submission. All grading will be done from submissions via the electronic course portal.***

Labeling Protocol

Please label all files submitted via the LMS by your last name and name of assignment (e.g., Lastname_Homework1.doc).

Late Assignments

Due to the cumulative structure of this course, late assignments will not be accepted for credit, except in truly extenuating circumstances. In the event that an assignment deadline must be missed, you must contact the instructor in advance in order to work out an acceptable alternative submission deadline. In other exceptional cases, contact the course instructor directly when able.

Grade of Incomplete

Only when work is not completed because of documented illness or other "emergency" occurring after the twelfth week of the semester (or 12th week equivalent for any course scheduled for less than 15 weeks), may the professor may assign a grade of incomplete, INC. An “emergency” constitutes a situation or event which could not be foreseen, and which is beyond the student's control and which prevents the student from taking any final paper, exam or completing other work during the final weeks of

class. A student may not request an INCOMPLETE (INC) before the end of the twelfth week (or 12th week equivalent for any course scheduled for less than 15 weeks).

Course work which is not completed on time does not meet the eligibility requirements for being considered “incomplete work” and will instead receive zero credits in the grade book. Please review the assignment late policy if you have questions about late versus incomplete coursework.

Syllabus Revisions

Faculty will assess progress and elicit student feedback regarding the course. If necessary, the Course Director will revise the syllabus during the course run to make it more suitable.

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.

Academic dishonesty has a far-reaching impact and is considered a serious offense against the university. Violations will result in a grade penalty, such as a failing grade on the assignment or in the course, and disciplinary action from the university itself, such as suspension or even expulsion.

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.

Course Content Distribution and Synchronous Session Recordings

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).

Prohibition on Uploading Course Materials to Generative AI Services

Submitting assignment prompts or other course materials to an AI generator is a violation of intellectual property and is disallowed under the USC policy prohibiting distribution of course materials (The USC Student Handbook, p. 13).

Policy on the Use of AI Generators

You are expected to uphold the highest standards of academic integrity, which encompass the appropriate and honest use of AI generators, such as ChatGPT, DALL-E, Copy.ai, and others.

What constitutes ethical use?

It is expected that all work you submit is yours and yours only, and that you use AI generators ethically should you choose to use them as a study tool. Ethical use comes down to your **intent** when utilizing these tools. If you use generative AI to complete portions of your work— to generate all your research, to write whole sentences or paragraphs, or to produce the entire assignment itself—then you are committing academic misconduct. Unless otherwise stated clearly in the assignment prompt or by your instructor, all work must be researched, planned, crafted, and completed by you.

Further, the submission to an AI generator of work that is not your own, such as assignment prompts provided by your instructor, other students' notes, or elements of assignment drafts not written by you, goes against the Course Content Distribution Policy, which states that no course content may be shared outside of the learning environment. Submitting course materials or the work of others to an AI generator is a violation of intellectual property and is prohibited.

Verifying and citing AI generators

Generative AI is prone to problems, such as creating fake or inaccurate information. You should neither assume that its results are correct nor that the information is unique to the AI tool: "[I]n addition to including the works of others without authorization, some generative AI models imitate another creator without clearly stating so and offering proper credit and attributions. This can be of particular concern when using AI- generated content in your research and academic work as you may be inadvertently

including another person's work with incorrect or no citation and attribution" (USC Libraries Research Guides, "Ethical Concerns with Generative AI"). Whenever you use generative AI, you are expected to back it up with other reputable sources.

Moreover, you must always demonstrate how you acquired the knowledge that you relay in your work. If you use generative AI to complement your research—note that it should never be the sole method of your research—you must cite it after you verified its accuracy. For guidance on how to cite AI, please refer to the USC Libraries research guide, "Using Generative AI in Research."

Explanation of AI use

No matter how little or how much you use an AI generator, you are responsible for providing an explanation that details why and how you used it. This explanation must be submitted with any assignment you complete with the help of AI. In your explanation, you must address the following points:

- Why did you choose an AI generator over other resources available to you, such as those offered by the USC Libraries or other resources that your instructor provided?
- How did you use the AI generator? For example, did you use it to brainstorm an idea, to spell check your writing, or did you extract information from it based on a prompt you inserted?
- What prompt(s) did you use to obtain the results (please see the note in the section above on ethical use)?
- Lastly, indicate in your description which parts of your assignment were crafted with the aid of an AI generator.

Failure to provide the above information when you use generative AI is considered a violation of academic integrity.

Consult your instructor

Failure to comply with these policies will result in reporting the academic misconduct to the Office of Academic Integrity. If you have any questions or doubts about what constitutes legitimate and ethical use of AI, please consult your instructor.

Live Sessions

Live Session Information

Live Sessions for this course take place in Zoom, periodically throughout the semester. You can click on the MEETINGS tab within your course in the LMS to join the live session meeting.

For details on the day and time of live sessions, please see the Live Session Schedule you received along with this syllabus. The Live Session Schedule will also be available in the LMS.

Live Session Policy

Students are required to attend all live sessions throughout the semester (with documented check-in) and to participate verbally with faculty acknowledgement. No exceptions are permitted; however, if medical or other previously excused absences are granted, an additional written assignment will be required for submission and counted toward the course participation grade.

Each live session may entail:

- A brief review of the feedback from the previous weeks;
- Course lecture or faculty presentation of core instructional materials;
- A Q&A session during which the professor will provide expanded directions on upcoming (major) analytic exercises and responds to student questions about future assignments;
- Exemplary coursework presentations by students highlighting high achievement to provide technology and content ideals for consideration and incorporation into classwork;
- A Q&A session and discussion during which the professor and/or coach will ask students to comment further on issues, questions, experiences and more.

Weekly Activity Schedule

Week 1 Introduction to Statistics and Excel Overview

Assigned Readings and Materials

Required:

- Read ch. 1, "Statistics and Models" in *Statistics for the Social Sciences: A General Linear Model Approach* (Warne, 2020).

Optional Materials (as needed):

- LinkedIn Learning Excel Training
- "How to Make Pie Charts in Excel"
- "How to Create Clustered Column Chart Excel"
- LinkedIn Learning: Ch. 1, "Introducing Excel Formulas and Functions" in Excel: *Introduction to Formulas and Functions*

Learning Activity	Due Date
Week 1 Assigned Readings and Materials	Day 3
Week 1 Live Session	*Please refer to the scheduled day and time.*
Week 1 Discussion: Self-Introduction	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 1 TedEd Lesson: Can You Outsmart a Troll (by Thinking Like One)?	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 1 Homework: Baseline Excel Assessment	Day 7

Week 2 Data and Measurement

Assigned Readings and Materials

Required:

- Read ch. 2, “Levels of Data” in *Statistics for the Social Sciences: A General Linear Model Approach* (Warne, 2020).
- Read *Selected International Best Practices in Police Performance Measurement* (Davis, 2012).
- Read *Measuring the Performance of the Police: The Perspective of the Public* (Maslov, 2015).
- Watch “*What are Validity & Reliability in Research? Simple explainer (with Examples)*” (Grad Coach, 2023).

Learning Activity	Due Date
Week 2 Assigned Readings and Materials	Day 3
Week 2 Live Session	*Please refer to the scheduled day and time.*
Week 2 TedEd Lesson: The Best Stats You've Ever Seen	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 2 Homework: Measures and Performance in Policing	Day 7
Week 2: Concept Check-ins	Day 7

Week 3 Visual Models

Assigned Readings and Materials

Required:

- Read ch. 3, “Visual Models” in *Statistics for the Social Sciences: A General Linear Model Approach* (Warne, 2020).
- Watch “How To Spot A Misleading Graph” (Gaslowitz, 2017).

Optional Materials (as needed):

Watch video instructions on:

- How to create frequency table
- How to create a histogram
- How to create a frequency polygon
- COUNTIFS function

Learning Activity	Due Date
Week 3 Assigned Readings and Materials	Day 3
Week 3 Live Session	*Please refer to the scheduled day and time.*
Week 3 Discussion: Visual Deception	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 3 Homework: Generating Visual Models	Day 7

Week 4 Measures of Central Tendency and Variability

Assigned Readings and Materials

Required:

- Read ch. 4, “Models of Central Tendency and Variability” in *Statistics for the Social Sciences: A General Linear Model Approach* (Warne, 2020).

Optional Materials (as needed):

- How to make a histogram in Excel

Learning Activity	Due Date
Week 4 Assigned Readings and Materials	Day 3
Week 4 Live Session	*Please refer to the scheduled day and time.*
Week 4 Discussion: Central Tendency, Variability and the Social Sciences	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 4 TedEd Lesson: How Statistics Can be Misleading	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 4 Homework: Central Tendency and Variability	Day 7
Week 4: Concept Check-ins	Day 7

Week 5 *z*-Scores and Linear Transformations

Assigned Readings and Materials

Required:

- Read ch. 5, “Linear Transformations and z-Scores” in *Statistics for the Social Sciences: A General Linear Model Approach* (Warne, 2020).
- Watch the TED Talk, “How Juries Are Fooled by Statistics” (Donnelly, 2005).

Optional Materials (as needed):

- Tufte: Beautiful Evidence
- Centre for Teaching: What is Data Visualization?
- Easelly: A Brief History of Infographics
- Perceptual Edge: Graphical Design Examples and Fixes

Learning Activity	Due Date
Week 5 Assigned Readings and Materials	Day 3
Week 5 Live Session	*Please refer to the scheduled day and time.*
Week 5 Discussion: Lies, Damn Lies and Statistics	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 5 Data Visualization: Descriptive Statistics	Day 7
Week 5: Concept Check-ins	Day 7

Week 6 Correlation

Assigned Readings and Materials

Required:

- Read ch. 12, “Correlation” in *Statistics for the Social Sciences: A General Linear Model Approach* (Warne, 2020).

Learning Activity	Due Date
Week 6 Assigned Readings	Day 3
Week 6 Live Session	*Please refer to the scheduled day and time.*
Week 6 Discussion: Correlation and Causation	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 6 TedEd Lesson: The Past, Present and Future of the Bubonic Plague	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 6: Concept Check-in	Day 7

Week 7 Midterm Exam

Assigned Readings and Materials

Required:

- Read “Generative AI And Data Science Have Mightily Paired Up to Reinvent Data Strategies, Exemplified Via Release of OpenAI’s ChatGPT Code Interpreter” (Eliot, 2023).

Learning Activity	Due Date
Week 7 Assigned Readings	Day 3
Week 7 Discussion: AI and Data Science	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Milestone Check-in	Day 7
Midterm Exam	Day 7

Week 8 Probability and the Central Limit Theorem

Assigned Readings and Materials

Required:

- Read ch. 6, “Probability and the Central Limit Theorem” in Statistics for the Social Sciences: A General Linear Model Approach (Warne, 2020).
- Read “Simple Explanation of the Central Limit Theorem” (See Data - Live!, 2021).

Learning Activity	Due Date
Week 8 Assigned Readings	Day 3
Week 8 Live Session	*Please refer to the scheduled day and time.*
Week 8 Discussion: Reflections on the Central Limit Theorem	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 8: Concept Check-in	Day 7

Week 9 Introduction to Hypothesis Testing

Assigned Readings and Materials

Required:

- Read ch. 7, “Null Hypothesis Statistical Significance Testing and z-Tests” in *Statistics for the Social Sciences: A General Linear Model Approach* (Warne, 2020).
- Watch the TED Talk, “How to Keep Human Bias Out of AI” (Sharma, 2018).
- Watch the TED Talk, “How I'm Fighting Bias in Algorithms” (Buolamwini, 2016).

Learning Activity	Due Date
Week 9 Assigned Readings and Materials	Day 3
Week 9 Live Session	*Please refer to the scheduled day and time.*
Week 9 Discussion: Bias and AI	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 9: Concept Check-in	Day 7

Week 10 One-Sample *t*-Tests and Confidence Intervals

Assigned Readings and Materials

- Read ch. 8, "One Sample *t*-Tests" in *Statistics for the Social Sciences: A General Linear Model Approach* (Warne, 2020).
- Watch the TED Talk, "The Power of a Hypothesis" (Tedx Talks, 2015).

Learning Activity	Due Date
Week 10 Assigned Readings and Materials	Day 3
Week 10 Live Session	*Please refer to the scheduled day and time.*
Week 10 Discussion: Hypothesis Testing	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 10 Concept Check-in	Day 7

Week 11 Testing Group Differences

Assigned Readings and Materials

Required:

- Read the following in *Statistics for the Social Sciences: A General Linear Model Approach* (Warne, 2020):
  - Ch. 9, “Paired Sample t-Tests”
  - Ch. 10, “Unpaired Sample t-Tests”

Optional Materials (as needed)

- COUNT function
- AVERAGE function
- VAR.S: Excel Formulae Explained
- STDEV.S function
- Standard Error (SE) Definition: Standard Deviation in Statistics Explained
- How to Calculate a Pooled Standard Error
- T Score Formula: Calculate in Easy Steps

Learning Activity	Due Date
Week 11 Assigned Readings and Materials	Day 3
Week 11 Live Session	*Please refer to the scheduled day and time.*
Week 11 Homework: Testing Group Differences	Day 7
Week 11 Concept Check-in	Day 7

Week 12 Analysis of Variance (ANOVA): Comparing Means and Three or More Groups

Assigned Readings and Materials

Required:

- Read ch. 11, “Analysis of Variance” in *Statistics for the Social Sciences: A General Linear Model Approach* (Warne, 2020).
- Read “How Could Generative AI Impact the Data Analytics Landscape?” (Sankaran, 2023).

Learning Activity	Due Date
Week 12 Assigned Readings	Day 3
Week 12 Live Session	*Please refer to the scheduled day and time.*
Week 12 Discussion: AI and the Future of Analytics	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 12 Concept Check-in	Day 7

Week 13 Dealing with Nominal Data: The Chi Square Test

Assigned Readings and Materials

Required:

- Read ch. 14, “Chi-Squared Test” in *Statistics for the Social Sciences: A General Linear Model Approach* (Warne, 2020).
- Watch “Chi-Square Statistic for Hypothesis Testing” (Khan Academy, 2018).

Learning Activity	Due Date
Week 13 Assigned Readings and Materials	Day 3
Week 13 Live Session	*Please refer to the scheduled day and time.*
Week 13 Homework: Evaluating Nominal Data	Day 7

Week 14 The Causal Argument: Regression Analysis

Assigned Readings and Materials

Required:

- Read ch. 13, “Regression” in *Statistics for the Social Sciences: A General Linear Model Approach* (Warne, 2020).

Learning Activity	Due Date
Week 14 Assigned Readings	Day 3
Week 14 Live Session	*Please refer to the scheduled day and time.*
Week 14 Discussion: Linear Regression - Why Range Restriction Matters	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Week 14 Data Visualization: Linear Regression	Day 7
Week 14 Concept Check-in	Day 7

Week 15 Final Exam Week

Assigned Readings and Materials

- None

Learning Activity	Due Date
Week 15 Discussion: Course Reflection	Day 4: *Initial Post* Day 5*: Post Questions* Day 7*: Post Responses*
Milestone Check-in	Day 7
Final Exam	Day 7

Required Readings and Materials

1. Buolamwini, J. (2016, November). *How I'm fighting bias in algorithms* [Video]. TED. https://www.ted.com/talks/joy_buolamwini_how_i_m_fighting_bias_in_algorithms?language=en
2. Davis, R. C. (2012). *Selected international best practices in police performance measurement*. RAND Corporation.
3. Donnelly, P. (2005, July). *How juries are fooled by statistics* [Video]. TED. https://www.ted.com/talks/peter_donnelly_how_juries_are_fooled_by_statistics?autoplay=true&muted=true&referrer=playlist-statistically_speaking
4. Eliot, L. (2023, July 17). Generative AI and data science have mightily paired up to reinvent data strategies, exemplified via release of OpenAI's ChatGPT code interpreter. *Forbes*. https://www.forbes.com/sites/lanceeliot/2023/07/17/generative-ai-and-data-science-have-mightily-paired-up-to-reinvent-data-strategies-exemplified-via-release-of-openais-chatgpt-code-interpreter/?sh=58e8ef8e287e
5. Grad Coach. (2023, September 5). *What are validity & reliability in research? Simple explainer (with examples*) [Video]. YouTube. https://www.youtube.com/watch?v=clAJ1sXwzNQ
6. Khan Academy. (2018, April 16). *Chi-square statistic for hypothesis testing* [Video]. YouTube. https://www.youtube.com/watch?v=jABsbNBPXIk&t=4s
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Statement on University Academic and Support Systems

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.

Student Financial Aid and Satisfactory Academic Progress:
To be eligible for certain kinds of financial aid, students are required to maintain Satisfactory Academic Progress (SAP) toward their degree objectives. Visit the Financial Aid Office webpage for undergraduate- and graduate-level SAP eligibility requirements and the appeals process.

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 consists 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) 740-2500
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.