

PP 5376 Applied Quantitative Methods

Wednesday 4:00-6:30 pm, TBD

Fall 2023 Semester

School of Public Policy, University of Connecticut

(Subject to changes)

Instructor: Dr. Jinhai Yu

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Office Hours: Wednesday 1:30-3:00 pm or by appointment

Course Description

This course will provide master-level graduate students with the application of the tools and methods of applied quantitative methods. Specifically, this course will cover descriptive statistics, probability theory, statistical inference, hypothesis testing, and correlation. This class's statistics help prepare students for more advanced work in PP 5331 Quantitative Methods for Public Policy.

Course Objectives

After taking the class, students should be able to:

- Understand concepts of descriptive and inferential statistics;
- Apply concepts of descriptive and inferential statistics to research designs;
- Interpret and present statistical results of social science research appropriately.

Teaching Methods/Activities

- We will use a flipped classroom strategy. The most significant advantage is that I can answer questions when you work on statistical problem sets.
- Before class, you should read the book chapters or assigned articles. You will also have access to the slides before class. The slides are quite comprehensive, but the book chapters may offer different perspectives or more context for applications of the statistical methods.
- Next, *you should watch the videos before class*. I will post recorded lectures to the course website. I will explain things on the slides in those videos. The videos usually take 30 minutes to watch. That means I assume you have already watched these videos and will not repeat them in class.
- I will first walk you through a few examples on the whiteboard in class. The examples will come from (1) the slides and (2) some additional materials. I will repeat select examples in the slides. This is a good chance for you to ask questions. The examples from the additional materials will contain both questions and solutions. They are provided as templates for you to learn how to solve them in the

- problem sets. These activities should take about 1 hour.
- For the second half of the in-class time, you will work in groups on problem sets.
 - After class, you should continue to work on the problem sets and the quizzes.
 - We will build up skills for statistics step by step. You will see that the topics and assignments are interrelated. If you find some parts hard to follow, it will help if you catch up earlier in the first half of the semester.
 - HuskyCT: We will use the course website on HuskyCT. Please make sure to check it for announcements regularly.
 - All questions should be emailed to jinhai.yu@uconn.edu. Please put the course number in the subject line. Make sure to use your university email addresses. As graduate students, your email should be written professionally. You can expect responses to questions within **three** business days. Grading and feedback will typically be returned within one week after the due dates.

Textbooks

The following book is required.

Meier, Kenneth J; Brudney, Jeffrey L.; Bohte, John. 2015. *Applied Statistics for Public and Nonprofit Administration, 9th Ed.* Stamford, CT: Cengage.

Other readings (e.g., journal articles or book chapters) can be downloaded from the course website. Readings with * are recommended only.

Statistical Package

We will use Stata (or Excel, TBD) for the statistical analysis. You can download Stata at: <https://software.uconn.edu/software/stata/>. We will provide tutorials for Stata or Excel, but there will be limited in-class time for doing this. If you need more help, please consult the online sources, attend office hours, or ask questions when we work on the problem sets in class.

Evaluation Criterion

Your grade will be determined as follows.

Assignment	Points	Due dates
Weekly brief	3	Various
Problem set 1	14	10/4
Problem set 2	15	10/25
Problem set 3	15	12/6
Group project	20	12/6

Concept quizzes (11 quizzes at 3 points)	33	See below
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Grading Scale

Grade	Letter Grade	GPA
93-100	A	4.0
90-92	A-	3.7
87-89	B+	3.3
83-86	B	3.0
80-82	B-	2.7
77-79	C+	2.3
73-76	C	2.0
70-72	C-	1.7
67-69	D+	1.3
63-66	D	1.0
60-62	D-	0.7
<60	F	0.0

Letter of Introduction

Before the second week of class, please write a one-page letter introducing yourself to the instructor. You can include courses taken relevant to this class (e.g., statistics or research methods), your career goals, your expectations for this course, or any fun facts you would like to share. The letter will not be graded but is required. In addition, please make sure to add a professional photo to your user profile on the HuskyCT website.

Participation

I expect students to participate actively in class discussions. You can ask or respond to your peers and instructor's questions. Each student contributes to achieving the course goals by participating in class activities. Lectures will be focused on fundamental concepts or applications. They can be abstract. Ask a question. Slow the class down. You may be doing your classmates a favor if they have similar questions. For recorded lectures, you are welcome to email your questions to me.

Weekly Briefing

Students will brief the class about the relevance or application of statistics. Students will be assigned to a weekly briefing schedule in the first week. The weekly briefing will take *five* minutes at the beginning of each class. Here are the specific requirements:

- Key question: How are statistical concepts or tools applied in public policy?
- You can focus on the statistical concepts covered in the week of your briefing or choose a different statistical concept from the course schedule.

- Your presentation should demonstrate how statistics can be applied to public policy, public administration, or public finance—any issues related to the public sector or nonprofit sector.
- Typically, you can find an article from journals, newspapers, and policy reports by think tanks. You can show how they conduct descriptive data analysis or inferential data analysis. Many examples are found in New York Times, Wall Street Journal, and Economist.
- You can also choose to brief selected pages from the readings with *.
- You should summarize the key information from the article in no more than three slides. Be sure to (1) identify the statistical concept, (2) give an example, and (3) discuss the implications for the relevance of statistics for public managers.
- You must submit the slides to HuskyCT within two days of your presentation.

There will be 3 points for this assignment. Your performance will be graded based on how well you address each requirement above.

Problem Sets

There will be *three* problem sets. They are designed to help you solve statistical problems. The problem sets will cover similar questions to the examples in the course slides and the in-class examples. Before working on the problem sets, ensure you understand the examples in the course slides and how they relate to the statistical concepts. In addition, I will walk through some in-class examples with questions and solutions so that you can see how these questions are solved.

You are strongly encouraged to work in groups, but your work will be graded individually based on your performance. To that end, each student should submit their own problem set. When grading the problem sets, both effort and accuracy will be considered. It is thus important to show the steps of how you solve the problems.

You should expect to spend extensive time and effort on these problem sets. They are not designed for you to complete in a few hours. You are strongly encouraged to start early. You may have time to work on problem sets in class. You should expect to work on them outside class as well. Some of you may be ready to work on the problems after watching the recorded lectures. Others may prefer to wait until the instructor walks through a few examples in class. You are always welcome to ask questions in class or by email.

Group Project

We will have one group project. The objective is to help you learn how statistical tools can be relevant and useful to answer research or policy questions in the real world. You will be asked to collect data to conduct statistical analysis to answer a research question of your own

choice. While we will not cover regression in this class, you can conduct descriptive analysis with good data visualization or demonstrate some correlations. The project will consist of multiple parts and different deadlines throughout the semester. You should work in groups. It is your responsibility to form a group. Your performance will be graded individually and as a group. Separate guidelines for the group project will be posted on the course website.

Concept Quizzes

We use short quizzes to assess your understanding of key statistical concepts. The quizzes are open books/notes. Students should **not** work in groups for the quizzes. You should complete the quizzes individually as if you were working on exams. The quizzes are typically due one week after we cover the topics. You are encouraged to complete the quizzes as early as possible. Each student can take the quizzes **up to twice** until the due date. The higher grade of the two submissions will be used for your final score. To reduce your anxiety, I will drop one quiz with the lowest grade at the end of the semester.

The schedule of the quizzes is as follows:

Concept quiz topics	Due dates (all due 11:59 pm, EST, on Tuesday)
Frequency distributions	9/19
Measures of central tendency	9/26
Measures of dispersion	10/3
Probability	10/10
Normal distribution	10/17
Binomial distribution	10/24
Sampling	10/31
Confidence intervals	11/7
Hypothesis testing	11/14
Testing group differences	11/21
Correlation	12/5

Estimated Out-of-class Workload (14 weeks)

Activity	Description	Hours per activity	Total (Hours)
Reading Assignments	30 pages per week	1	14
Watch videos	1 hour per week	1	14
Problem sets	3 problem sets	10	30
Group project	1 project	10	10
Concept quizzes	11 concept quizzes	0.5	5.5
Estimated workload		5.25 hours/week	

Late Assignments

Late assignments will result in a 10% reduction in the grade. Please get in touch with me ahead of time if there are any special circumstances. No late assignments will be accepted after the last day of class on December 6, 2023. There are no exceptions to this final deadline.

Grading Grievances

If you wish to have an assignment re-graded, please let me know within three business days after you receive it. If you ask for a grade change, you must provide specific, concrete written evidence for your request. This process can lead to your grades increasing or decreasing or staying the same. Generic concerns will not lead to a review of the grades. But I am happy to provide advice on how to improve in future assignments.

If you have any questions about your grade on an assignment, please wait until the next day after receiving your assignment before discussing the grade with me. There are no exceptions to this policy.

Class Courtesy

Each student contributes to class learning by being courteous to his or her peers and the instructor. This is a graduate class for future public managers or administrators. I expect students to behave as **responsible professionals**. If you have a question, please raise your hands. Needless to say, whispering in class does not contribute to your own learning and is disruptive to your peers and the instructor.

Students should come to class on time and leave class when it is dismissed. Since we use a flipped classroom strategy, the second half of the in-class time is typically intended for you to work on problem sets. Without legitimate reasons, you are not expected to leave early. Also, you should not use the in-class time to do things irrelevant to this class.

Laptops are allowed for note-taking only. Cell phones and all other electronic devices should be turned silent in class.

Food or drink is allowed to the extent that it is not disruptive to others.

For more information, refer to “The Student Code” here:

<https://community.uconn.edu/the-student-code-preamble/>. Also, please refer to “Policy Against Discrimination, Harassment and Related Interpersonal Violence”

<https://policy.uconn.edu/2015/12/29/policy-against-discrimination-harassment-and-related-interpersonal-violence/>.

Violating the class courtesy policy will result in a penalty of final grade: You will receive a one percent deduction of your final grade for each violation after the second one; you will receive an email warning for your first offense.

Students with Disabilities

Before the second week of class, please see me for academic accommodations for a documented disability.

The University of Connecticut is committed to protecting the rights of individuals with disabilities and assuring that the learning environment is accessible. Students who require accommodations should contact the Center for Students with Disabilities, Wilbur Cross Building Room 204, (860) 486-2020 or <http://csd.uconn.edu/>. The University policy can be accessed here: <https://policy.uconn.edu/2011/05/24/people-with-disabilities-policy-statement/>.

Academic Integrity

I expect the highest standard of academic integrity for each student. Cheating, plagiarism, or academic misconduct will not be tolerated. For instance, students should work on their own for the quizzes; failure to do so results in academic misconduct.

For more information, students should consult the University's policy on scholarly integrity for graduate students at <https://policy.uconn.edu/2014/04/11/policy-on-scholarly-integrity-in-graduate-education-and-research/>.

Accommodations for Illness or Extended Absences

Please stay home if you are feeling ill and please go home if you are in class and start to feel ill. If illness prevents you from attending class, it is your responsibility to notify me as soon as possible. You do not need to disclose the nature of your illness. However, you must work with me to determine how you will complete coursework during your absence.

If life circumstances are affecting your ability to focus on courses and your UConn experience, students can email the Dean of Students at dos@uconn.edu to request support. Regional campus students should email the Student Services staff at their home campus to request support and faculty notification.

Statement on Copyright

My lectures, notes, handouts, and displays are protected by state common law and federal copyright law. They are my own original expression and I've recorded them prior or during my lecture in order to ensure that I obtain copyright protection. Students are authorized to take notes in my class; however, this authorization extends only to making one set of notes for your own personal use and no other use. I will inform you as to whether you are authorized to record my lectures at the beginning of each semester. If you are so authorized to record my lectures, you may not copy this recording or any other

material, provide copies of either to anyone else, or make a commercial use of them without prior permission from me.

Disclaimer

The instructor reserves the right to make changes to the syllabus. All changes will be announced on the course website on HuskyCT.

Weekly Course Plan

Week/Date	Topics	Readings
Week 1 (August 30)	Introduction	
Week 2 (September 6)	STATA/EXCEL Tutorials 1. Review of algebra 2. Software tutorial	Schutt, Russell K. 2019. <i>Investigating the Social World</i> . Los Angeles, CA: Sage. Chapter 14
Week 3 (September 13)	Frequency distributions 1. Watch videos before class 2. Examples 3. Work on Problem Set 1	1. Meier et al. (2015): Chapter 4 2. *Schwabish, Jonathan A. "An economist's guide to visualizing data." <i>Journal of Economic Perspectives</i> 28, no. 1 (2014): 209-34.
Week 4 (September 20)	Measures of central tendency 1. Watch videos before class 2. Examples 3. Work on Problem Set 1	1. Meier et al. (2015): Chapter 5 2. *Cook, Dianne, Eun-Kyung Lee, and Mahbubul Majumder. "Data visualization and statistical graphics in big data analysis." <i>Annual Review of Statistics and Its Application</i> 3 (2016): 133-159.
Week 5 (September 27)	Measures of dispersion 1. Watch videos before class 2. Examples 3. Work on Problem Set 1	Meier et al. (2015): Chapter 6
Week 6 (October 4)	Probability 1. Watch videos before class 2. Examples 3. Work on Problem Set 2	TBD
Week 7 (October 11)	Normal distribution 1. Watch videos before class 2. Examples 3. Work on Problem Set 2	1. Meier et al. (2015): Chapter 7 2. *Jones, Bryan D., Frank R. Baumgartner, Christian Breunig, Christopher Wlezien, Stuart Soroka, Martial Foucault, Abel François et al. "A general empirical law of public budgets: A comparative analysis." <i>American Journal of Political Science</i> 53, no. 4 (2009): 855-873.
Week 8 (October 18)	Binomial distribution 1. Watch videos before class 2. Examples 3. Work on Problem Set 2	Meier et al. (2015): Chapter 8
Week 9 (October 25)	Sampling 1. Watch videos before class	Schutt, Russell K. 2019. <i>Investigating the Social World</i> . Los Angeles, CA: Sage. Chapter 5

	<ul style="list-style-type: none"> 2. Examples 3. Work on Problem Set 3 	
<p>Week 10 (November 1)</p>	<p>Confidence intervals</p> <ul style="list-style-type: none"> 1. Watch videos before class 2. Examples 3. Work on Problem Set 3 	Meier et al. (2015): Chapter 10
<p>Week 11 (November 8)</p>	<p>Hypothesis testing</p> <ul style="list-style-type: none"> 1. Watch videos before class 2. Examples 3. Work on Problem Set 3 	<ul style="list-style-type: none"> 1. Meier et al. (2015): Chapters 11, 12 2. *Avellaneda, Claudia N. "Mayoral decision-making: Issue salience, decision context, and choice constraint? An experimental study with 120 Latin American mayors." <i>Journal of Public Administration Research and Theory</i> 23, no. 3 (2013): 631-661.
<p>Week 12 (November 15)</p>	<p>Testing the difference between two groups</p> <ul style="list-style-type: none"> 1. Watch videos before class 2. Examples 3. Work on Problem Set 3 	<ul style="list-style-type: none"> 1. Meier et al. (2015): Chapter 13 2. *King, Gary, Emmanuela Gakidou, Kosuke Imai, Jason Lakin, Ryan T. Moore, Clayton Nall, Nirmala Ravishankar et al. "Public policy for the poor? A randomised assessment of the Mexican universal health insurance programme." <i>The lancet</i> 373, no. 9673 (2009): 1447-1454.
<p>Week 13 (November 22)</p>	<p>Thanksgiving Holiday, No Class</p>	
<p>Week 14 (November 29)</p>	<p>Correlation</p> <ul style="list-style-type: none"> 1. Watch videos before class 2. Examples 3. Work on Problem Set 3 	<p>*Chetty, Raj, Matthew O. Jackson, Theresa Kuchler, Johannes Stroebe, Nathaniel Hendren, Robert B. Fluegge, Sara Gong et al. "Social capital I: measurement and associations with economic mobility." <i>Nature</i> 608, no. 7921 (2022): 108-121.</p>
<p>Week 15 (December 6)</p>	<p>Group Presentation</p> <p>Student presentation of group project</p>	