NYU | ROBERT F. WAGNER GRADUATE SCHOOL OF PUBLIC SERVICE

UPADM-GP 111: Quantitative Analysis for Public Policy
Spring 2022

Instructor Information

- Doris Zahner
- Email: dzahner@nyu.edu
- Office Hours: By appointment

Teaching Assistant Information

- Jack Tiedemann
- Email: jt3926@nyu.edu
- Office Hours: By appointment

Course Information

- Class Meeting Times: Mondays, 01/24 – 05/09, 4:55 – 7:25 pm
- Class Location: 194-196 Mercer Street, Room 203
- Lab Meeting Times: Thursdays, 01/24 – 05/09, 8:00 – 9:00am
- Lab Location: Silver 411

Course Description

Introduces students to basic statistical methods and their application to management, policy, and financial decision-making. Covers the essential elements of descriptive statistics and univariate and bivariate statistical inference and introduces multivariate analysis. Emphasizes applied statistics and data analysis in addition to statistical theory. Encourages a critical approach to reviewing statistical findings and using statistical reasoning in decision-making.

Translation: In this class, you will learn about how to use data to think about social science questions. This course is introductory only in the sense that we assume no prior knowledge of statistics or advanced mathematics. We plan to move fast and help you acquire the tools you need to be successful in a rapidly evolving field, to be able to perform your own independent analysis in a variety of contexts, to understand published research, and to be a sophisticated consumer of quantitative information. You will leave this class with technical skills that you can use and a better ability to understand the world around you.

Course and Learning Objectives

By the end of the semester, you should be able to:

1. have a broader and more general understanding of statistics and social science research when reading articles, both academic and general;
2. be able to identify the appropriate statistical analyses to apply to specific research questions;
3. be proficient in using Excel for conducting statistical analyses and;
4. be able to form conclusions based upon results of the statistical analyses**.**

Learning Assessment Table

Course Learning Objective Covered	Corresponding Assignment Title
#1,3	Homework 1
#1,2	Homework 2
#1, 2, 3, 4	Homework 3
#1, 2, 3, 4	Homework 4
#1, 2, 3, 4	Homework 5
#1, 2, 4	Midterm Exam
#1, 2, 3, 4	Homework 6
#1, 2, 3, 4	Homework 7
#1, 2, 3, 4,	Homework 8
#1, 2, 3, 4	Homework 9
#1, 2, 3, 4	Homework 10
#1, 2, 3, 4	Final Project

Textbooks and Materials

Readings for this class will come from a textbook, listed below, and from other handouts and materials that I will produce and post on the NYU Classes website.

Required:

- Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., & Cochran, J. J. (2020). *Modern business statistics with Microsoft Excel*. New York: Cengage Learning.
- MindTap for Essentials of Modern Business Statistics with Microsoft® Excel®, 8th Edition (NOTE: This is the required courseware connected to the required textbook; an e-book is included in MindTap so you do not need to purchase the textbook separately unless you require a physical copy of the book).
- Microsoft Excel in Office 365

The course requires access to Excel. Within Excel, the Data Analysis ToolPak should be installed. Please download the full version of Excel, which is available through Office 365 (register with your NYU email). Instructions on how to download Office 365 are available here:
https://www.microsoft.com/en-us/education/products/office
https://www.nyu.edu/life/information-technology/computing-support/software/software/ms-office.html

You must download the full version of Excel to your computer. The online version will not be sufficient for this course.

Course Requirements and Grading
Your performance in this class will be assessed through multiple assignment types. These components are weighted:

- Pre-Class Quizzes: 10%
- Homework Assignments: 30%
- Midterm Exam: 30%
- Final Project: 30%

Pre-class quizzes:
These are available online in advance of class via the Quizzes section in Brightspace. These are multiple-choice questions based on the reading for that week as well as the past material for the course. These questions focus on major themes to help you identify and review critical concepts, prepare for class each week, and prepare for the exam. These are for you to do on your own, not as part of a group, because they are graded based on how many you answer correctly. These should only take about 2-15 minutes to complete: only open the quiz when you are ready. They need to be completed by the Monday of the following class by 1:00 pm ET.

Homework Assignments:
Your homework assignments are posted online and are due before the next lecture. Your homework assignments will be graded based in part on how well you answer the questions. While you must turn in your own answers, it is acceptable to work on these with other people in the course. The Thursday lab section will address only the most difficult questions and will focus mostly on the Excel portion of the assignment, **so you must attempt your homework in advance**.

You must turn in your homeworks via NYU Classes by 1pm one week after it has been assigned. No late homework will be accepted. No exceptions.

Midterm Exam:
The midterm exam will be given the week of Monday, March 7th. This is exam is open book, open notes, and entirely online. It will not be timed, but you will need to complete the exam in one sitting.

Final Project:
The final project will consist of a data set and some research questions. You will conduct the appropriate statistical analyses and provide a write up of the results. This will be due at the end of the semester (in lieu of an in-person final exam). Details for this project will be released later in the course via NYU Classes. This will be turned in via NYU Classes online.

Administrative Details
This section provides a few other guidelines for the course.

Course Organization:
This course has two weekly meetings – a lecture and a lab section. The lectures will be based on, but not limited to, the readings listed for that lecture period: do the reading in advance of class. In addition, you should review the past week's homework solutions and make sure you remember the main points from the prior lecture as well. You will really need to do the reading to have success on the concept quizzes.

Mr. Jack Tiedemann will teach the lab section; this focuses mostly on broad discussions on the points raised by the more difficult homework problems or key skills students seem to be struggling with overall. Before you come to the lab section, start your homework. There will not be time in the lab sections to cover every homework question; you will get the most out of these by preparing in advance.

Anticipated Plan:

- Mondays: Read, Do the Concept Questions (Quiz), come to class
- Tuesdays: Do the Homework
- Wednesdays: Do the Homework
- Thursdays: Lab Section, Ask Questions
- Fridays: Finish HW.
- Saturdays/Sundays: Do something else. It's a big, interesting world, especially NYC!

Office Hours/Additional Help:

I will hold office hours by appointment. Typically, it's best to schedule something with me for right after class. If this doesn't work, we can find another time that works. There is also a lot of optional materials through MindTap. These include Excel videos, applets, and ungraded practice problems.

Email:

"Should we email you or email Jack?" In general, you should copy both of us. Email is the quickest way to get a response from us regarding your questions for the course.

Late or Missing Assignments:

No late assignments will be accepted and there are no exceptions. You must complete the concept question quizzes by their deadline and submit the homework online by the due date.

Special Requests:

Excused absences and other accommodations should be requested and discussed in advance. A student with a qualified disability requesting a reasonable accommodation should do so through the Moses Center.

The Course Website:

All of the materials you will need for the course will be posted on Brightspace and via the online textbook and MindTap. You should regularly check the course website and, of course, pay attention to course-related emails sent to you through it. These will often contain important announcements.

Technology:

This is a high-use course for technology – computers, cell phones, etc. are often useful in class for doing computations and accessing the course website. If you have a laptop, bring it to class since we will be using Microsoft Excel for our data analyses.

Date	Lecture	Topic	Reading/MindTap		Quiz	HW	Lab?
01/24	00	**Introduction to the Course** We will discuss the role of quantitative methods in public policy and other social sciences. We will review the syllabus of this course and go through NYU Classes. We will also get Excel set up on everyone's laptops.	Lecture 00 Introductory Materials Chapter 1		No	None, but you should watch the introductory videos in MindTap	Yes
01/31	01	**Quantitative & Qualitative Data & Numerical Descriptive Measures** We will cover the basics of descriptive statistics, which include categorizing variables, measuring center and spread, and work on some basic graphing in Excel.	Chapters 2 - 3		Yes Due 02/07 1pm ET	HW01 Due 02/07 1pm ET	Yes
02/07	02	**Probability** Very often skipped in introductory statistics courses, probability is essential to understand because it is the bases of statistics. We will review classical probability along with more advanced concepts such as conditional probability and the Bayes' Theorem.	Chapter 4		Yes Due 02/1 1pm ET	HW02 Due 02/14 1pm ET	Yes
02/14	03	**The Sampling Distribution, Central Limit Theorem, & Confidence Intervals** We will begin to formally study inferential statistics, which is the foundation for social science research. The idea is that researchers take representative samples of data and make inferences about a population based upon the characteristics of that sample. We will also be introduced to the normal distribution, which is fundamental to this course.	Chapters 6 – 8		Yes Due 02/21 1pm ET	HW03 Due 03/21 1pm ET	Yes
02/21		**No class today**					No

Date	Lecture	Topic	Reading/MindTap		Quiz	HW	Lab?
02/28	04	**Hypothesis Testing, Part I & Midterm Review** Lecture this week provides a statistical foundation for the most important question a researcher will ask: does this yield significant results? More generally, the hypothesis testing framework provides guidelines for deciding if the characteristics of one group are different than other. We will be looking at comparing one group to a population for both large and small samples.	Chapter 9		Yes Due 03/07 1pm ET	HW04 Due 03/07 1pm ET	Yes
03/07		**Midterm Exam** You will be taking the midterm exam this week online. The exam is open-book, open-notes, and calculator permitted.			No	No	No
03/14		**No class - SPRING BREAK!**					No
03/21	05	**Hypothesis Testing, Part II** As a continuation from Lecture 04, we will be looking at hypothesis testing for two groups compared to each other for both large and small samples.	Chapter 10		Yes Due 03/28 1pm ET	HW05 Due 03/28 1pm ET	Yes
03/28	06	**One-way ANOVA** This is a continuation of hypothesis testing. We will be looking at how to conduct hypothesis tests for studies that contain more than two groups.	Chapter 13		Yes Due 04/04 1pm ET	HW06 Due 04/04 1pm ET	Yes
04/04	07	**Two-way ANOVA** What happens when you have more than one variable you are interested in testing? Today, we will look at the methodology for comparing two or more groups on two variables simultaneously.	Chapter 13		Yes Due 04/11 1pm ET	HW07 Due 04/11 1pm ET	Yes

Date	Lecture	Topic	Reading	Quiz	HW	Lab?
04/11	08	**The Chi-Square Distribution** Today we will cover a distribution that can be used for three different types of research questions: are two categorical variables independent, is the distribution of a categorical variable as expected, and is the variance of the sample the same as the population?	Chapter 12	Yes Due 04/18 1pm ET	HW08 Due 04/18 1pm ET	Yes
4/18	09	**Regression, Part I** This is the last major topic covered in class this semester. We will look at how to analyze (and create hypotheses for) continuous data. Regression is also related to covariance and correlation, which we will study as well.	Chapter 14	Yes Due 04/25 1pm ET	HW09 Due 04/25 1pm ET	Yes
04/25	10	**Regression, Part II** We will continue studying regression models and introducing multiple-variable (multivariate) regression. As part of this class, there will also be an opportunity to ask any last questions on the final project.	Chapter 15	Yes Due 05/02 1pm ET	HW10 Due 05/02 1pm ET	Yes
05/02		**Final Project Working Session** Your final projects are due 05/17/2021 by at 1pm on NYU Classes.		No	No	No

Academic Integrity
Academic integrity is a vital component of Wagner and NYU. All students enrolled in this class are required to read and abide by Wagner's Academic Code. All Wagner students have already read and signed the Wagner Academic Oath. Plagiarism of any form will not be tolerated and students in this class are expected to report violations to me. If any student in this class is unsure about what is expected of you and how to abide by the academic code, you should consult with me.

Henry and Lucy Moses Center for Students with Disabilities at NYU
Academic accommodations are available for students with disabilities. Please visit the Moses Center for Students with Disabilities (CSD) website and click the "Get Started" button. You can also call or email CSD (212-998-4980 or mosescsd@nyu.edu) for information. Students who are requesting academic accommodations are strongly advised to reach out to the Moses Center as early as possible in the semester for assistance.

NYU's Calendar Policy on Religious Holidays
NYU's Calendar Policy on Religious Holidays states that members of any religious group may, without penalty, absent themselves from classes when required in compliance with their religious obligations. Please notify me in advance of religious holidays that might coincide with exams to schedule mutually acceptable alternatives.