



NYU

**ROBERT F. WAGNER GRADUATE
SCHOOL OF PUBLIC SERVICE**

PADM-GP 4505

R Coding for Public Policy Fall 2022

Instructor Information

- Mike Zhu
- Email: mz909@nyu.edu
- Office Hours: Sundays 10:00 AM - 11:30 AM EST (Virtual)

Course Prerequisites

- CORE-GP.1011.001 Statistical Methods for Public, Nonprofit, and Health Management

Course Description

R is one of the most popular in a new generation of statistical packages that is used in public policy settings from data management, visualization, and analysis, among many other applications. It also finds wide use in data science and statistics. **R** is a powerful open source language and environment for statistical computing and graphics.

This 7-week mini course leads the students into the **R** world, helps them master the basics and establishes a platform for future self-study. The course offers students basic programming knowledge and effective data analysis skills in **R** in the context of public policy-making and policy evaluation.

Course and Learning Objectives

Students will learn how to install **R** and **RStudio**, understand and use **R** data objects, become familiar with base **R** and several statistical and graphing packages. The course will also emphasize use cases for **R** in public policy domains, focusing on cleaning, exploring, and analyzing data.

What You Will Take Away:

Upon completion of the course, you will be able to:

1. Install and set up **R** and **RStudio**
2. Find, install and use **R** packages
3. Understand basic programming concepts and how they apply to the **R** language
4. Read, manipulate, and clean data

5. Plot simple, clear graphics for effective policy analysis
6. Conduct regression and classification using R packages
7. Apply data analysis best practices using R

Learning Resources

Software:

- R Development Core Team (2005). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0
- RStudio Team (2015). [RStudio: Integrated Development for R](#). RStudio, Inc., Boston, MA

Textbook:

- Hadley Wickham & Garrett Grolemund (2017). [R for Data Science](#)

NYU Brightspace

All announcements, resources, and assignments will be delivered through the NYU Brightspace site. I may modify assignments, due dates, and other aspects of the course as we go through the term with advance notice provided as soon as possible through the course website.

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.

NYU's Wellness Exchange

NYU's Wellness Exchange has extensive student health and mental health resources. A private hotline (212-443-9999) is available 24/7 that connects students with a professional who can help them address day-to-day challenges as well as other health-related concerns.

Student Resources

Wagner offers many quantitative and writing resources as well as skills workshops. The library also offers a variety of data services to students. Here is a short list of the resources most relevant to learning R.

Wagner Quantitative Resources:

- Tutoring Schedule
- Math Review: Resources and In-Person Session

NYU Library Data Services

- Consultation
- Classes
 - Introduction to R
 - Data Management in R
 - Creating Graphics with R

Assessment Assignments and Evaluation

The Course Grade is based on the following:

- Participation: 10%
- 5 Assignments: 90%

The instructions for each assignment will be released after the lecture. The assignment is due the following week. Points will be deducted from late submissions, 3 (20% of full credit) for each late day.

Grading Scale and Rubric:

Students will receive grades according to the following scale (there is no A+):

- A = 4.0 points
- A- = 3.7 points
- B+ = 3.3 points
- B = 3.0 points
- B- = 2.7 points
- C+ = 2.3 points
- C = 2.0 points
- C- = 1.7 points
- There are no D+/D/D-
- F (fail) = 0.0 points

Student grades will be assigned according to the following criteria:

(A) Excellent: Exceptional work for a graduate student. Work at this level is unusually thorough, well-reasoned, creative, methodologically sophisticated, and well written. Work is of exceptional, professional quality.

(A-) Very good: Very strong work for a graduate student. Work at this level shows signs of creativity, is thorough and well-reasoned, indicates strong understanding of appropriate methodological or analytical approaches, and meets professional standards.

(B+) Good: Sound work for a graduate student; well-reasoned and thorough, methodologically sound. This is the graduate student grade that indicates the student has fully accomplished the basic objectives of the course.

(B) Adequate: Competent work for a graduate student even though some weaknesses are evident. Demonstrates competency in the key course objectives but shows some indication that understanding of some important issues is less than complete. Methodological or analytical approaches used are adequate but student has not been thorough or has shown other weaknesses or limitations.

(B-) Borderline: Weak work for a graduate student; meets the minimal expectations for a graduate student in the course. Understanding of salient issues is somewhat incomplete. Methodological or analytical work performed in the course is minimally adequate. Overall performance, if consistent in graduate courses, would not suffice to sustain graduate status in “good standing.”

(C/-/+) Deficient: Inadequate work for a graduate student; does not meet the minimal expectations for a graduate student in the course. Work is inadequately developed or flawed by numerous errors and misunderstanding of important issues. Methodological or analytical work performed is weak and fails to demonstrate knowledge or technical competence expected of graduate students.

(F) Fail: Work fails to meet even minimal expectations for course credit for a graduate student. Performance has been consistently weak in methodology and understanding, with serious limits in many areas. Weaknesses or limits are pervasive.

Overview of the Semester

- Week 1
 - Topic: Introduction to **R** and Rstudio
 - Deliverable: Install **R** and RStudio
- Week 2
 - Topic: Data objects, functions, and the tidyverse
 - Deliverable: Assignment 1
- Week 3
 - Topic: Graphics in **R**
 - Deliverable: Assignment 2
- Week 4
 - Topic: Application I: Data quality & cleaning data
 - Deliverable: Assignment 3
- Week 5
 - Topic: Application II: Exploratory Data Analysis
 - Deliverable: Assignment 4
- Week 6
 - Topic: **R** for predictive analytics
 - Deliverable: Assignment 5
- Week 7
 - Topic: Other real-world tools & applications