RUTGERS–NEWARK
School of Public Affairs and Administration

Data Analysis for Decision-Making (20:834:561) [3 credits]

Course Description

This course covers the essentials of research design, methods of data collection, and quantitative data analysis tools for policy evaluation and management decision-making. The course trains students in data visualization, descriptive statistics, cross-tabulation, confidence intervals, hypothesis testing, and correlation and regression analysis. The course encourages hands-on work with real data, use of statistical software, and the effective presentation of graphical and numerical results.

Learning Objectives

After completing this course, students will be able to:

- Apply concepts of research design to make sense of the methods and findings of published studies and other empirical evidence in the student's area of interest.
- Interpret statistical analyses of the kind most often used in public policy and management research.
- Implement essential techniques of research design and data analysis for management decision-making.

Requirements

Requirements will vary by instructor and may include:

- *Reading:* In addition to textbook readings, students may also read actual policy and management studies that illustrate important research methods and data analysis techniques.
- *Class discussions and exercises:* Students will actively engage in in-class discussions and exercises in which they practice and apply key concepts.
- *Short projects:* Students complete a set of short projects in the form of a policy memo or data analysis exercise.
- *Exam(s):* May vary in terms of length and format, but there will commonly be at least one final comprehensive examination.
- *Research project:* Students will develop a research project during the semester, which may include a proposed research design, review of published studies, or analysis of real-world data.

Schedule / Outline of Topics

- Week 1: Introduction to Research Design
- Week 2: Theory, Models, and Qualitative Research
- Week 3: Measurement and Descriptive Status
- Week 4: Data Management and Visualization
- Week 5: Sampling and Survey Research
- Week 6: Confidence Intervals and Significance Tests
- Week 7: Hypothesis Testing
- Week 8: Analysis of Variance
- Week 9: Correlation and Linear Regresssion

- Week 10: Multiple Regression Analysis
- Week 11: Causation and Randomized Experiments
- Week 12: Natural and Quasi Experiments
- Week 13: Politics and Ethics of Research
- Week 14: Final Presentations/Exam

Texts / Materials / Resources

The selection of textbooks and readings will vary by instructor. Listed below are some of the possible textbooks, materials, and resources an instructor may select for this course:

- Lind, Marchal and Wathen. 2023. *Statistical Techniques in Business and Economics*, 19th Edition. McGraw Hill.
- Urdan, T. C. (2017). *Statistics in Plain English* (4th edition). Routledge.
- Llaudet, E., & Imai, K. (2022). *Data Analysis for Social Science: A Friendly and Practical Introduction*. Princeton University Press.
- Remler, D., & Van Ryzin, G. (2022), *Research Methods in Practice: Strategies for Description and Causation*. SAGE.
- Best, J. (2012). *Damned Lies and Statistics: Untangling Numbers from the Media, Politicians, and Activists*. University of California Press.