

## PSCI 200: Data Analysis I

Room: Goergen 108

Days and Time: MW, 2:00pm-3:15pm

Instructor: Prof. Sergio Montero

Office: M, 3:30pm-4:30pm, Harkness Hall 313

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**Course Description:** Data analysis has become a key part of many fields including politics, business, law, and public policy. This course covers the fundamentals of data analysis, giving students the necessary statistical skills to understand and critically analyze contemporary political, legal, and policy puzzles. Topics include descriptive statistics, experiments, surveys, probability, hypothesis testing, and linear regression. Data analysis will be conducted using R and RStudio. Students should bring a laptop to class.

*Number of Credit Hours:* This course follows the College credit hour policy for four-credit courses. The course meets twice weekly for 150 minutes per week. The remaining credit hour is fulfilled through independent reading and completion of the homeworks. Additionally, the TA will hold a weekly computational workshop. Attending the workshop is not required but is highly recommended.

**Prerequisites:** No prior knowledge of statistics or data analysis is required. Working knowledge of high-school algebra is the only course prerequisite. Without special permission of the instructor, students may not enroll in this course if they have earned credit and a letter grade for ECO 230, PSC 205, PSY/CSP 211, STT 211, STT 212, STT 213, STT 214, or any other course in statistics, or if they have received a score of 4 or 5 on the Advanced Placement exam in Statistics.

**Grading:** Evaluation is based on (roughly) weekly problem sets (30%), three in-class exams (20% each), and class participation (10%).

The lowest homework grade will be dropped when calculating the final course grade to allow for illness or other unforeseen events. Late assignments will be penalized 10/100 points for each day they are late. Homeworks more than 7 days late will not be accepted.

*Collaboration Policy:* While collaboration on problem sets is encouraged, all assignments must be completed individually.

*Academic Honesty:* Please be familiar with the University's policies on academic integrity and disciplinary action (<https://www.rochester.edu/college/honesty/>).

*Disability Resources:* The University respects and welcomes students of all backgrounds and abilities. If you encounter any barriers to full participation in this course, please contact the Office of Disability Resources (<https://www.rochester.edu/college/disability/>).

**Text:** Ellena Llaudet and Kosuke Imai (2022), *Data Analysis for Social Science: A Friendly and Practical Introduction*.

**Computing:** Students will learn to code in R ([www.r-project.org](http://www.r-project.org)) using RStudio ([www.rstudio.com](http://www.rstudio.com)). A computing workshop will be held on TBD.

### **Course Schedule:**

January 22: Course overview

January 27: Introduction to R and RStudio (Chapter 1–1.6)

January 29: Observations and Variables (Chapter 1.7)

February 3: Computing and Interpreting Means (Chapter 1.8–1.10)

February 5: Estimating Causal Effects with Randomized Experiments (Chapter 2–2.4)

February 10: Does Social Pressure Increase Turnout (Chapter 2.5–2.7)

February 12: Review

February 17,19: No Class

February 24: First Exam

February 26: Survey Research and Exploring One Variable at a Time (Chapter 3–3.4)

March 3: Exploring the Relationship Between Two Variables (Chapter 3.5–3.7)

March 5: Predicting Non-Binary Outcomes Using Linear Regression (Chapter 4–4.4)

March 10,12: No Class (Spring Break)

March 17: Predicting Binary Outcomes Using Linear Regression (Chapter 4.6–4.9)

March 19: Review

March 24: Second Exam

March 26: Estimating Causal Effects with Observational Data (Chapter 5–5.3.1)

March 31: Controlling for Confounders (Chapter 5.3.2–5.4.2)

April 2: Internal versus External Validity (Chapter 5.5–5.7)

April 7: Probability (Chapter 6–6.8)

April 9: Hypothesis Testing (Chapter 7–7.6)

April 14: Do Small Classes Improve High-School Graduation Rates? (Chapter 7.7)

April 16: Do Women Promote Different Policies than Men?

April 21: Does Social Pressure Affect Turnout?

April 23: Is There Racial Discrimination in the Labor Market?

April 28: Review

April 30: Third Exam