

**IR602 A1: Quantitative Analysis for International Affairs**  
**Frederick S. Pardee School of Global Studies**  
**Spring 2022 Course Syllabus**

**The Formalities:**

**Professor Rachel Brulé**

[rebrule@bu.edu](mailto:rebrule@bu.edu)

**Class: MW 4:30-5:45 PM, CAS 330**

**Office Hours: MW 11:30am–12pm F 3pm– 5pm**

*Monday = drop in; WF = by appointment only. Please schedule meetings on Calendly at [calendly.com/rabrule](https://calendly.com/rabrule)*

Mon OH: <https://bostonu.zoom.us/j/91907572713?pwd=eU91MVVTeDRtY2RLbEp1ZzNQk0rZz09>

Monday Office Hours meeting ID: 919 0757 2713; password: CAS330a

Wed OH: <https://bostonu.zoom.us/j/99138801966?pwd=Qkl4QUl4QUNDaTdUZ25HSTFOQ092VGhUQT09>

Wednesday Office Hours meeting ID: 991 3880 1966; password: CAS330b

Friday OH: <https://bostonu.zoom.us/j/96011297876?pwd=K0hkdnpQLzZkc2o1Ync3amNKTGIHZZ09>

Friday Office Hours meeting ID: 960 1129 7876; password: CAS330c

**Teaching Assistant: Sobia Shadbar ([sobias@bu.edu](mailto:sobias@bu.edu))**

**TA Office Hours:** Tuesdays & Thursdays 11am-12pm

**Course Website:**

Log into Blackboard Learn website at [learn.bu.edu](https://learn.bu.edu)

**The Course:**

**Course Description:** This course is an introduction to the core statistical methods that drive international policy design and analysis. Students who engage fully with the material will learn how to formulate hypotheses, critically assess the data collection process, the quality of the resulting data, and the application of statistical tools for data analysis to address public policy problems and the solutions applied to date. The course aim is to prepare international affairs practitioners with statistical literacy, including the capacity to assess and deploy statistical reasoning tools and techniques. It will emphasize hands-on learning using real social, political, and policy data and analysis.

**What we will do:** Over the semester, we will work to understand what data actually is, and how the inferences we draw are only as good as the process that begins with the initial conceptualization of questions, problems, or puzzles, the resulting process of data collection, “cleaning” and evaluation, as well as the coding and analysis of variables, all culminating in the visualization and discussion of results. In addition, we will learn how to “read” and run statistical analysis. This requires learning the logic of statistical tools utilized to evaluate relationships – and ideally, identify causation – in international events and policy. To achieve these two aims, we begin by discussing why we collect data and how we formulate hypotheses. We next study methods of data collection, qualitative and quantitative, and how to address ethical challenges in gathering, analyzing, and disseminating data. With these core concepts in mind, we learn how to conduct basic and descriptive statistics, including how to

“visualize” data. We then focus on causal inference and hypothesis testing, with the aim of developing an understanding of how methods of inference can give us the means to analyze policy problems. We conclude with applying this knowledge to improve the databases collected now to answer crucial questions about national and global policies.

IR602 A1 is designed to introduce all students to quantitative analysis techniques grounded in issues and problems that Pardee MA students will encounter in their careers as international relations practitioners. To do so, we build knowledge collaboratively, and commit to engage in self-reflection as a core tool to identify the ways different individuals (with varied bodies, contexts, and cultures) experience data and the data-driven policies of states, local communities, and global organizations in fundamentally distinct ways. Assignments will critique and expand the relevance of quantitative analysis for policy-relevant datasets.

**Prerequisites and Corequisites:** Graduate standing in the Pardee School or permission of instructor.

**Primary Textbook:** Michael A. Bailey (2021) *Real Stats: Using Econometrics for Political Science and Public Policy*. Oxford University Press. You can purchase this as a print or digital version at:  
<https://global.oup.com/academic/product/real-stats-9780190859497?cc=us&lang=en>

References: Bueno de Mesquita & Fowler (2021) *Thinking Clearly with Data: A Guide to Quantitative Reasoning & Analysis*, Greene (2008) *Econometric Analysis*, Wooldridge (2003) *Introductory Econometrics*.

### The Work of the Course:

- **Participation:** This is a collaborative course, where you are expected to read the required texts; watch short, flipped lectures; and, as a group, work through a short set of review questions, so that the core work we do together is discussion of core concepts raised in the required readings and lectures, and application of these concepts to concrete data and policy questions through work in groups. Each week will begin with a lecture, posted by the start of the week, to which you are required to listen. You are also required to complete the required reading prior to class. I expect you to be reading the required text, *Real Stats*, to understand big-picture statistical tools well enough so that you can use them to answer important questions. It's okay not to understand every detail, but if you personally or collectively as a group find yourself hitting a wall or needing support, tag me in the margins of your group google doc anytime up to the start of class. I will also share a short set of review questions at the start of each week that you work through as a group in a shared google doc, to complete before class begins. Each week's first class will start with Q&A on core concepts and applications, followed by substantial class time for group work on problem sets and projects. The class will be a cooperative learning experience where we build a supportive, expansive intellectual community. In order for us to work together as a community, this requires us to each find ways to be “present” in and outside the classroom. If you can't finish work for any reason, please talk with me (and your collaborators) in advance.
- **Journal posts:** Throughout the semester you will be writing posts in a dedicated google doc. I will ask you to write a first reflection in week 1 on your main learning objectives, including what skills and experience you will leverage to achieve these objectives and what support will be most important for you to marshal to overcome the challenges you need to surmount in the process. Consider one concrete question you want to answer. Explain it, and include new insights on how to answer it with concrete material from each week's readings. Please do update this doc as well whenever you achieve an important objective, or identify/address a challenge. Following the midterm, in week 6, I expect you to write a reflection on two things: Which aspects of the course have been most successful for you so far? What challenges have you encountered? I encourage you to quote from or link to examples of your work directly in your self-reflection. For a final reflection, by the end of week 14, write me a short letter that reflects on your work in this class. Consider the work you completed on the final, your work earlier in the term, the feedback you offered your peers on their work, and how you met your own goals. Include

links to examples of your work. Did you miss any significant work? Is there anything of which you are particularly proud? What letter grade would you give yourself? (Developed by [Jesse Stommel](#)).

- **Problem sets and Projects:** There will be frequent problem sets (6) to aid your internalization of core concepts and skill understanding, building, and analyzing data. These are meant to be completed as a group, with substantial contributions from each member; a project where you have the opportunity to become an expert in a new database currently being collected to guide future global and national policies; and the final project for the course will be a group project to improve this new database and identify the policy implications that follow from your new contribution to the database. You are encouraged to collaborate with your peers on assignments.

**Learning Assessment and University Policies:** Details provided at the syllabus end, on **pages 7-8**.

## Course Outline:

The speed at which each section will be completed depends on each class. Week numbers are merely approximations and may vary considerably depending on the time constraint. However, all material should be covered by the course end. Chapters, unless otherwise mentioned, refer to the required text.

### I. INTRODUCTION: Weeks 1-2

#### a. The Quest for Causality, Week 1

- i. How do we build knowledge? Specification of the core statistical model
- ii. Understanding the major challenges to causal inference: randomness and endogeneity
- iii. Randomized experiments as the gold standard
- iv. Ethical issues in research (start)

Required reading: Bailey (2021) *Real Stats*, Chapter 1 (1-25).

Case (\*weeks 1-2): The perils of over-reliance on quantitative data analysis – *race, inequality & policing*

Review: Lily Hu (2021) “Race, Policing, and the Limits of Social Science,” *Boston Review*.

<https://bostonreview.net/articles/race-policing-and-the-limits-of-social-science/>

Randomized Experiments: Graeme Blair et al. (2021) “Community Policing Does Not Build Citizen Trust in Police or Reduce Crime in the Global South, *Science*, 374(6571), <https://graemeblair.com/papers/mkiv.pdf>

Data: <https://www.policedatainitiative.org/datasets/> Tutorial: <https://openpolicing.stanford.edu/tutorials/>

\*Further reading: David Hausman and Dorothy Kronick (2021) “When Police Sabotage Reform by Switching Tactics,” *Working Paper*. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3192908](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3192908)

#### b. Introduction to Programming, Stata, and Appropriate Data Practices, Week 2

- i. Introduction to data & replication files. *Case study: race & policing, continued.\**
- ii. Stata introduction and tutorial
- iv. Ethical issues in research with human subjects (continued)
- v. Peer work: pick one state in the Stanford Open Policing Project (<https://openpolicing.stanford.edu/>) dataset (<https://openpolicing.stanford.edu/data/>) with your peer. Write a hypothesis on the kind of variation you expect to see (think simple: variation in variable 1 is associated with changes in variable 2). Download the dataset for that specific state in .csv format, open it in Stata, and study your two variables of interest independently. Try to figure out how they relate to one another (what is their correlation?).

Required reading: Bailey (2021) *Real Stats*, Chapter 2 (26-46); Useful commands for STATA (xviii-xix)

Review: [Stata Tutorials](#) by Prof. Kelly Bauer, Occidental College (2021); Create your first .do file for PS1.

Review: Deborah Raji (2020) “How our data encodes systematic racism,” *MIT Technology Review*, 10 Dec.

<https://www.technologyreview.com/2020/12/10/1013617/racism-data-science-artificial-intelligence-ai-opinion/>

Review: Caroline Criado Perez (2019) *Invisible Women: Exposing Data Bias in a World Designed for Men*, London: Vintage, Preface (xi-xv)\* *on blackboard*.

### II. THE OLS FRAMEWORK, Weeks 3-6

#### a. Bivariate OLS: The Foundation of Econometric Analysis, Week 3

- i. Bivariate Regression Models
- ii. Random Variation in Coefficient Estimates
- iii. Endogeneity and Bias (this is tough and important – review carefully!)
- iv. Precision of Estimates; Probability Limits and Consistency; Goodness of Fit
- v. Solvable Problems: Heteroscedasticity and Correlated Errors

Required reading: Bailey (2021) *Real Stats*, Chapter 3 (47-93)

Case: Gender gap in political economy preferences & political engagement

Review: Rachel Brulé and Nikhar Gaikwad (2021) “Culture, Capital and the Political Economy Gender Gap: Evidence from Meghalaya's Matrilineal Tribes,” *Journal of Politics*, 83(3): 834-835. [1<sup>st</sup> 2 pages only!]  
<https://www.journals.uchicago.edu/doi/abs/10.1086/711176>

Replication Data: <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/18EH2Y>

Peer work: replicate a component of Table 1; explain what you learn from it. What worth changing & why?

**PROBLEM SET 1 DUE : 4:30pm Wednesday, February 9, 2022**

## **b. Hypothesis Testing & Review, Weeks 4-7**

- i. Hypothesis testing: rationale and structure of analysis
- ii. Evaluating results: significance level, t-tests, p-values, confidence intervals and statistical power
- iii. *Reading statistics* - Brulé and Gaikwad (2021) “Culture, Capital and the Political Economy Gender Gap”

Required reading: Bailey (2021) *Real Stats*, Chapter 4 (94-130)

Review: Lillian MacNell, Adam Driscoll, Andrea Hunt (2015) “What’s in a Name: Exposing Gender Bias in Student Ratings of Teaching,” *Innovative Higher Education*, 40(4): 291-303, [via BU Library](#).

Review: Rachel Brulé and Nikhar Gaikwad (2021) “Culture, Capital and the Political Economy Gender Gap: Evidence from Meghalaya's Matrilineal Tribes,” *Journal of Politics*, 83(3): 834-850. [Full paper!]

Peer work: explain one hypothesis, the test, and interpret results together. Is this test appropriate? Ideal? Why/not?

**PROBLEM SET 2 & Reflection Questions DUE: 9pm Friday, February 18, 2022**

**PROBLEM SET 3 & Reflection Questions DUE: 9pm Friday, February 25, 2022**

**MIDTERM (Group & Individual): Monday, February 28, 2022**

**SPRING RECESS (Saturday, March 5<sup>th</sup> – Sunday, March 13<sup>th</sup>, 2022)**

## **c. Multivariate OLS: Weeks 8-9**

- i. Fighting endogeneity with multivariate OLS
- ii. Omitted variable bias
- iii. Measurement error
- iv. Precision and goodness of fit
- v. Standardized coefficients; hypothesis testing involving multiple coefficients

Required reading: Bailey (2021) *Real Stats*, Chapter 5 (131-183)

Review: Kimuli Kasara and Pavithra Suryanarayan (2020) “Bureaucratic Capacity and Class Voting: Evidence from across the World and the United States,” *Journal of Politics*, 82(3), [via BU Library](#);

Replication Data: <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/UQVN70>

**Problem Set 4 Due: 9pm Friday, March 18, 2022**

**Reflection Questions for Bailey, Chapter 5 Due: 9pm Friday, March 25**

## **d. The Power of Dummy Variables: Weeks 10-11**

- i. Bivariate OLS with dummy variables to assess differences of means
- ii. Interpreting dummy independent variables in multivariate OLS
- iii. Transforming categorical variables to multiple dummy variables
- iv. Interaction variables

Required reading: Bailey (2021) *Real Stats*, Chapter 6 (184-226)

Review: Heather Sarsons (2017) “Recognition for Group Work: Gender Differences in Academia,” *American Economic Review: Papers and Proceedings*, 107(5): 141-5. [Available through BU library.](#)

Review: C.M. Bosancianu et al. (2021) “Political and Social Correlates of Covid-19 Mortality,” *Working Paper*, updated as of 8 October, 2021. At: [https://wzb-ipi.github.io/corona/WD\\_paper.pdf](https://wzb-ipi.github.io/corona/WD_paper.pdf)

Data: “Dashboard: Social and Political Correlates of Covid-19,” *WZB | Institutions and Political Inequality Group*, updated as of 1 December, 2021. Available at: <https://wzb-ipi.github.io/corona/>

**Reflection Questions on Bailey, Chapter 6 Due: 9pm Friday, April 1, 2022**

**Problem Set 5 (Concepts) Due 9pm Friday, April 8, 2022**

**Problem Set 6 (STATA) Due 9pm Friday, April 15, 2022**

### **III. THE MODERN ECONOMETRIC TOOLKIT, Week 13**

#### **a. Experiments, Week 13**

- i. Randomization and balance
- ii. Compliance and intention-to-treat models
- iii. Using 2SLS to address non-compliance
- iv. Attrition (or how what you don’t know can hurt you)
- v. Natural experiments (practical and powerful)

Required reading: Bailey (2021) *Real Stats*, Chapter 10 (344-383)

Review: Scott Desposato (2014) “Ethics and Research in Comparative Politics,” *The Washington Post*, 3/11: <https://www.washingtonpost.com/news/monkey-cage/wp/2014/11/03/ethics-and-research-in-comparative-politics/>

Robin D.G. Kelley (2016) “Black Study, Back Struggle,” *Boston Review*, 1 March, at: <https://bostonreview.net/forum/robin-kelley-black-struggle-campus-protest/>

Poulami Roychowdhury (2016) “A Call to Knowledge: Let’s Gather More Data Before Rushing to Action” *Gender & Society*, 23 Feb, at: <https://gendersociety.wordpress.com/2016/02/23/a-call-to-knowledge-lets-gather-more-data-before-rushing-to-action/>

Trisha Phillips (2021) “Ethics of Field Experiments,” *Annual Review of Political Science*, Vol. 24: 277-300. <https://www.annualreviews.org/doi/10.1146/annurev-polisci-041719-101956>

Elizabeth Levy Paluck and Donald P. Green (2009) “Deference, Dissent, and Dispute Resolution: An Experimental Intervention Using Mass Media to Change Norms and Behavior in Rwanda,” *American Political Science Review*, 103(4): 622-644. [Available via BU Library.](#)

Replication data: <https://isps.yale.edu/research/data/d011>

**April 18<sup>th</sup>, 2022: Patriot’s Day, No Class.**

**Reflection Questions Due: 9pm Friday, April 22, 2022**

**Week 14: Review** – each group Teaches ½ Chapter of Bailey [Chap 5,6,10] w/application: experimental design

**Group Presentations & Review throughout Week 14**

**FIRST GROUP COMPONENT OF EXAM: In Class Monday-Wednesday, Week 14**

**Week 15: Final Full Course Review (Bring your notes & questions!)**

**SECOND COMPONENT (INCLUDING INDIVIDUAL) OF FINAL: Wednesday, May 4, 2022**

**Final presentation slides (group) & Reflections (individual) due by 4pm Friday, May 6, 2022**

Data: “Dashboard: Social and Political Correlates of Covid-19,” *WZB | Institutions and Political Inequality Group*, updated as of 1 December, 2021. Available at: <https://wzb-ipi.github.io/corona/>

Template/inspiration: *The COVID-19 Model Challenges:* <https://eos.wzb.eu/ipi/shiny-covid-crowdsourcing/>

## LEARNING ASSESSMENT & POLICIES

**Assessment:** Your final grade will be based on the number of assignments you complete, the quality of these (how you achieve the goals for each assignment, embodying your comprehension and application of core concepts), and the quality of your reflection throughout the semester to identify and achieve your core learning objectives, with meaningful support for your peer community's learning.

Letter Grade	Assignments Achieved
D	<ul style="list-style-type: none"><li>• 4 Problem Sets, 4 group reflection questions</li></ul>
C	<ul style="list-style-type: none"><li>• 6 Problem Sets, 4 group reflection questions</li></ul>
B-	<ul style="list-style-type: none"><li>• 6 Problem Sets, 5 group reflection questions (adequate)</li><li>• Midterm (Adequate)</li></ul>
B	<ul style="list-style-type: none"><li>• 6 Problem Sets, 5+ group reflection questions (adequate)</li><li>• Midterm (Adequate)</li><li>• Final (Adequate)</li></ul>
B+	<ul style="list-style-type: none"><li>• 6 Problem Sets, 5+ group r. questions (mostly reflective)</li><li>• Midterm (Adequate-Excellent)*</li><li>• Final (Adequate-Excellent)* [<i>one of two is Excellent</i>]</li></ul>
A-	<ul style="list-style-type: none"><li>• 6 Problem Sets, 5+ group r. questions (mostly reflective)</li><li>• Midterm (Advanced, acceptable learning: High-level Adequate or Excellent grade)* [<i>one of two is Excellent</i>]</li><li>• Final (High-level Adequate or Excellent grade)*</li></ul>
A	<ul style="list-style-type: none"><li>• 6 Problem Sets, 5+ group r. questions (all reflective)</li><li>• Midterm (Advanced, exemplary learning: Excellent)</li><li>• Final (Advanced, exemplary learning: Excellent)</li></ul>

All assignments (other than in-class quizzes) should be submitted on the date due by 9pm. **Work submitted up to a week late will receive half credit. Later work will not receive credit, unless exceptional circumstances merit and are discussed and agreed upon *in advance of the due date*.**

**Office Hours and Email: I invite students to come to office hours as needed.** I expect *one* office hour appointment (*scheduled via Calendly*) minimum with each student. I guarantee that students will learn more if they come often. No questions are too basic. Students may arrange to come to office hours in small groups, which I particularly encourage for problem sets and group assignments.

**I require students to write email as a response to the first message I send to the class** to ensure I receive them. I will respond to emails within 24 hours *on weekdays*. Emails received on the weekend will not receive a response until Monday, and weekday emails will often receive a response the following weekday. Please plan accordingly. I strongly encourage students to use this syllabus and our course notes as a resource for questions. Please make sure your question cannot be answered this way before sending email. Class and office hours are the primary space for asking and answering questions.

**COVID-19 Compliance Protocol:** Adherence to BU guidelines on COVID-19 including testing and wearing a mask is a condition of attending class in person. If students are not wearing a face covering or observing physical distancing norms, class will be stopped until a relevant student(s) change(s) behavior.

### **Digital Conduct Code**

Misuse of classroom video and recording can violate the Academic Conduct Code, the Student Conduct Code (<https://www.bu.edu/dos/policies/student-responsibilities/>), the Policy on Computer Ethics (<http://www.bu.edu/policies/conditions-of-use-policy-computing-ethics/>), and in some cases Massachusetts state law. Expectations for behavior are based on simple principles of privacy and mutual respect by which all students must abide. Expectations for digital conduct include (not restricted to):

- Students may not record class sessions without permission.
- Students may not share recordings made by the instructor or others with anyone who is not enrolled in the class.
- Students may not share other students' personal information that is revealed in class.
- Harassment of fellow students is strictly forbidden.

If you are uncertain whether a particular action conforms with/violates these principles, please ask me.

### **Academic Integrity**

All Boston University students are expected to maintain the highest standards of academic honesty and integrity. It is the responsibility of every student to be aware of the university's Academic Conduct Code's contents and to abide by its provisions. Plagiarism and academic dishonesty of any kind will not be tolerated. For additional information, please refer to the complete Academic Conduct Code and the BU CAS Policies and Procedures using the links below.

<https://www.bu.edu/academics/policies/academic-conduct-code/>

<https://www.bu.edu/cas/students/graduate/grs-forms-policies-procedures/>

The work you submit must be your own, with clear and accurate citations for the source of any quotations, data, or ideas. Collaboration among students on assignments is not allowed except within the boundaries of group work, when intra-group collaboration is explicitly required.

### **Disabilities**

Boston University is committed to providing equal access to our coursework and programs to all students, including those with disabilities. In order to be sure that accommodations can be made in time for all exams and assignments, please plan to turn in your accommodations letter as soon as possible after the first class to the instructor [or Head TA for multi-section classes]. After you turn in your letter, please meet with me to discuss the plan for accommodations so that we can be sure that they are adequate and you are supported in your learning. If you have further questions or need additional support, please contact the Office of Disability Services ([access@bu.edu](mailto:access@bu.edu)). For more details, see: <https://www.bu.edu/cas/students/graduate/grs-forms-policies-procedures/>

### **Land Acknowledgement**

We acknowledge that the territory on which Boston University stands is that of The Wampanoag and The Massachusetts People. Our classroom and BU's campus should be places to honor and respect the history and continued efforts of the Native and Indigenous community leaders which make up Eastern Massachusetts and the surrounding region. We must acknowledge the history that brought us to reside on the land, and to help us seek understanding of our place within that history. Ownership of land is itself a colonial concept; many tribes had seasonal relationships with the land we currently inhabit. Today, Boston is still home to indigenous peoples, including the Mashpee Wampanoag and Wampanoag Tribe of Gay Head (Aquinnah). For more information, please visit the [North American Indian Center of Boston](#) and the [Commission on Indian Affairs of the State of Massachusetts](#).