



UC SANTA BARBARA
Bren School of Environmental
Science & Management

EDS 241: Environmental Policy Evaluation (2 units, Winter 2025)

Meeting Time & Location

Meeting Time

Wednesday, 9:30-10:45 am

Location

Bren Hall 1424

Instructor Information

Instructor: Adam Garber

Email: agarber@ucsb.edu

Office hours: Monday 9-11am; Thursday 3-5pm (Bren Hall 3526)

By appointment: Tuesday 3-4 pm; Friday 10-12 pm (Bren Hall 3418)

TA: Annie Adams

Email: aradams@ucsb.edu

Office hours: Thursday 11am-12pm (Bren Hall 3418)

Course Website:

<https://garberadamc.github.io/eds241-policy-eval/>

All course materials, resources, and important information will be posted to this course website. Be sure to bookmark it somewhere you can easily find it!

Course Details

Course Description:

This course will present state of the art program evaluation techniques necessary to evaluate the impact of environmental policies. The program evaluation methods presented will aim at identifying and measuring the causal effect of policies, regulations, and interventions on environmental outcomes of interest. Students will learn the research designs and methods for estimating causal effects with experimental and non-experimental data. This will prepare the students for interpreting and conducting high-quality empirical research, with applications in cross-sectional data and panel data settings.

Learning Outcomes:

- Differentiate observational, experimental, and natural experiment studies
- Gain expertise in suite of research methods widely used in environmental science
- Identify which contexts to apply causal inference strategies
- Build foundational knowledge to design and implement advanced statistical methods
- Expand set of data science tools to communicate statistical results

Required reading:

Book: Angrist, J. D., & Pischke, J. S. (2015). *Mastering 'Metrics: The Path from Cause to Effect*. Princeton University Press.

This course follows the presentation of topics outlined in the book *Mastering 'Metrics* by Angrist and Pischke (A&P). This book can be [purchased online](#)– having a personal copy is highly recommended, as it will be a key resource for our discussions and assignments throughout the class. Two copies will also be available for reference in the Bren library.

Articles: A series of applied research studies will be assigned as reading which we will use to study the application of research methods.

Grades:

- **Participation (20%):** The participation grade includes End of Class surveys (EOCs; 5%) and in-class participation (15%). In-class participation will consist of group activities, class discussion, and an instructor/student check-in meeting to learn about your current interests/goals for the MEDS program (scheduled before week 3 during office hours).
- **Assignments (40%):** Two assignments will be posted to practice the application of conceptual methods covered in this course by analyzing real data sourced from environmental science research.
- **Final group project presentation (40%):** The final project will consist of group presentations in which you will teach the class a key causal inference method based on an applied study.

Assignment resubmission policy: Students may resubmit assignments to recover up to 50% of the points missed in the initial assignment submission. **Assignment dates are subject to change*

- *Assignment 1: Posted 1/8 → Due 1/26 → Re-submit Due 1/31*
- *Assignment 2: Posted 1/22 → Due 2/16 → Re-submit Due 2/21*

Computing requirements:

Reminder: You can reference the [MEDS installation guide](#) if you need to (re)install / (re)configure any software.

- [Minimum MEDS device requirements](#)
- R version 4.4.0 (or higher)
- RStudio version 2024.04.2 (or higher)
- git (configured on your local computer) & GitHub account (connected to your local git)

Tentative Schedule

- **A&P:** Mastering 'Metrics, Angrist & Pischke
- **GLMs:** Generalized Linear Models
- **EOC:** End of class survey

Week	Lecture (Tuesday)	Assignments	Reading
0	[Before class begins]	Pre-class survey	- A&P: Intro. & Chapter 1 - Article (quick read): Buntaine et al. (2024)
Week 1 1/8	- Introductions & syllabus - Intro. to causal inference - Coding exercise: From observation to causal effects	- HW 1: Posted - W1: EOC survey	- A&P: Chapter 2 - Article: Buntaine et al. (2024)
Week 2 1/15	- Experiments & potential outcomes - Matching, fixed effects - Applied example (Buntaine study) - Coding exercise: GLMs	- W2: EOC survey	- Read about GLMs conceptual
Week 3 1/22	- Guest lecture: Professor Mark Buntaine (competition experiment)	- HW 1: Due - Final project: Assign groups/goals - W3: EOC survey	- A&P: Chapter 3 - Read GLM study example
Week 4 1/29	- Instrumental variables (IV) - Coding exercise: GLMs - Exploring GLMs applied in environmental science	- HW 2: Posted - W4: EOC survey	- Article: GLM studies in ESM - Article: IV study example
Week 5 2/5	- Coding exercise: IV example - Communicating GLM results - Interpreting GLMs exercise	- W5: EOC survey	- A&P: Chapter 4 - Article: RDD study example
Week 6 2/12	- Regression discontinuity (RDD) - Coding exercise: RDD example - Panel data	- HW 2: Due - W6: EOC survey	- A&P: Chapter 5 - Article: Stokes (2015)
Week 7 2/19	- Guest lecture: Professor Matto Mildenberger (climate policy natural exp.)	- W7: EOC survey	- A&P: Chapter 6 - Article: multi-ID study
Week 8 2/26	- Difference in Difference (DiD) - Coding exercise: DiD example	- W8: EOC survey	
Week 9 3/5	- Panel data - Random effects - part-1	- W9: EOC survey	
Week 10 3/12	- Bayesian statistics - Random effects - part-2	- W10: EOC survey	
Week 11	Team project - Student presentations [Tuesday, 8-11am] Turn in portfolio component [Friday, 12:00 pm]		

Course Conduct

Access and Accommodations

Please submit requests for accommodations often and early. It is never too late to apply for DSP accommodations. If you have any kind of disability, whether apparent or non-apparent, learning, emotional, physical, or cognitive you may be eligible to use formal accessibility services on campus. To arrange class-related accommodations, [please contact DSP](#). DSP will initiate communication about accommodations with faculty. By making a plan through DSP, appropriate accommodations can be implemented without disclosing your specific condition or diagnosis to course instructors.

Course conduct

All students are expected to read and comply with the [UCSB Code of Conduct](#). We are committed to making this course a welcoming and inclusive environment for everyone, regardless of gender, gender identity and expression, race, age, sexual orientation, disability, physical appearance, or religion (or lack thereof). We expect all students to help ensure this environment of inclusivity and will not tolerate harassment of any form.

Student Resources

There are *many* on-campus resources for helping students navigate different challenges and/or grow community. I am always available to discuss your individual needs and help guide you towards a campus resource that may be best suited to your situation. A number of those resources are listed, below:

Basic Needs Resources & Food Insecurity

UCSB has a dedicated team for helping students navigate and find help meeting basic needs. Explore the [Basic Needs Resources](#) web page for more information on their many resources, including information on the [CalFresh Program](#) and [The Associated Students food bank](#).

- **NOTE: Booking an appointment with a CalFresh representative or Basic Needs Advising counselor is highly recommended!**
 - You can schedule a [CalFresh Appointment](#) for help starting an application or receiving guidance on applying for CalFresh
 - Schedule a [Basic Needs Advising Session](#) to help identify which basic needs resources might be the best fit for your needs / information on how to access those resources
 - See the [Basic Needs Resources page](#) for other appointment options

Counseling and Psychological Services (CAPS)

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce your ability to participate in daily activities. CAPS is available to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus. They can be reached by phone at 805.893.4411, or online at <http://caps.sa.ucsb.edu>. The CAPS building is the pink building next to the Humanities and Social Science building (HSSB)

Resource Center for Sexual and Gender Diversity (RCSGD)

Located in the Student Resource Building (SRB), RCSGD offers a host of services for LGBTQ+ students, including a library and many events throughout the year. Learn more at: <https://rcsgd.sa.ucsb.edu/>

Undocumented Student Services (USS) Program

The USS Program and associated [Dream Scholars Resource Team](#) (DSRT) offer workshops, help students find scholarships and financial support, and work to provide community for undocumented students. Learn more at: <https://uss.sa.ucsb.edu/>

Campus Learning Assistance Services (CLAS)

CLAS helps students grow academically by offering workshops, walk-in and pre-scheduled tutoring, and writing help both for native and non-native (ESL) English as a second language speakers. Over 50% of students will stop by CLAS at one time or another. <http://clas.sa.ucsb.edu>

Student Resource Building (SRB)

The SRB houses many campus resources offices, including the African Diasporic Cultural resource Center, the American Indian Resource Center, the Asian Resource Center, the Middle Eastern Resource Center, the Non-Traditional and Re-Entry Student Resource Center. <http://www.sa.ucsb.edu/student-resource-building/home>

Multicultural Center (MCC)

The MCC, located in UCEN, hosts a wide variety of cultural events and educational programming throughout the year, including film showings, lectures, musical performances, and more: <http://mcc.sa.ucsb.edu/>

Campus Advocacy, Resources, & Education (CARE)

CARE offers 24/7 confidential support and advocacy in situations of sexual assault, dating and domestic violence, and stalking. Located in the SRB, they can be reached at 805.893.4613 or <http://wgse.sa.ucsb.edu/care/home>

Financial Crisis Response Team

If you are experiencing issues of housing insecurity contact the Financial Crisis Response Team at financialcrisis@sa.ucsb.edu to begin application for assistance.

Health and Wellness

Student well-being is integral to academic success, student development, and life satisfaction. On this website, students will find links to a range of services related to well-being such as: assistance with basic needs (food, housing, finances); counseling and physical health resources, daily wellness centers and programs; social connection, and personal safety. <https://wellbeing.ucsb.edu/>

Acknowledgements

This syllabus contains material adapted from course syllabi authored by [Sam Csik](#), Ruth . This new website houses materials which are heavily reused, adapted from, and inspired by Sam Csik's original work.