UC SANTA BARBARA
Bren School of Environmental Science & Management

Environmental Policy Evaluation
EDS 241 / ESM 244
(4 units, Winter 2026)

Meeting Time & Location

Lecture

Tuesday & Thursday: 8:00-9:15 am, BH 1414

Lab

Friday: L1: 9:00-10:20 am / L2: 10:30-11:50 am, BH 3022A

Instructor Information

Instructor: Adam Garber
Email: agarber@ucsb.edu
Office hours: Tuesday 12-2pm (Bren Hall 3520)
Meet by appointment: Monday - Friday (email to make appointment)

Co-Instructor: Annie Adams
Email: aradams@ucsb.edu
Office hours: Thursday 3-4 pm (Bren Hall 3418)

Course Website:

https://garberadamc.github.io/W26-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:

By the end of this course, students will be able to:

- Critically evaluate the validity of environmental policy research
- Apply causal inference methods to analyze policy data
- Work collaboratively to investigate environmental policy case studies
- Implement reproducible data analysis workflows

Required reading:

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). The required text for this class can be found here – 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 policy evaluation methods.

Grades:

- **Participation (20%):** The participation grade includes weekly reading quizzes (10%) and in-class participation (10%). In-class participation will consist of group activities, class discussion, and an instructor/student check-in meeting to learn about your current interests.
- **Assignments (40%):** Two assignments will be posted to practice the application of conceptual methods covered in this course by analyzing data sourced from environmental science studies.
- **Final group project (40%):** The final project will consist of group presentations and a public-facing blog post. In the presentations you will teach the class a key causal inference method based on an applied study. See final project instructions (TBA).

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

Late submission policy: Extensions will not be granted unless approved in advance under special circumstances. Late submissions will only be accepted by the resubmission deadline and may earn up to 50% of the total points.

Computing requirements:

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

- Minimum 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)

Schedule (subject to change)

This schedule and proposed topics are subject to change! [A&P: *Mastering 'Metrics*, Angrist & Pischke; **GLMs**: Generalized Linear Models **]**

Week	Lecture (Tuesday & Thursday)	Assignments	Reading
Week 0	[Before class begins]	- Class Survey	- *A&P: Intro. & Chapter 1*

1/2 - 1/5		- Reading	- *Article:* Buntaine et al. (2024)
Week 1 TU: 1/6 TH: 1/8	- Intro. to Causal Inference - Design Based Infer. & Experiments - Potential Outcome Framework - Lab: Experiment case study	- **HW 1: Posted** - W1: Quiz	- *A&P: Chapter 2* - *Article:* Buntaine et al. (2024)
Week 2 TU: 1/13 TH: 1/15	- Generalized Linear Models (GLMs) - Panel data, Fixed Effects - Applied example (Buntaine study) - Lab: Estimating GLMs	- W2: Quiz	- *Article (GLMs):* Carruthers et al., 2008
Week 3 TU: 1/20 TH: 1/22	- Matching Methods - Precision v. Accuracy: Error Adj. - **Guest Speaker:** Professor M. Buntaine	- **HW 1: Due 1/26** - W3: Quiz	- *A&P: Chapter 5* - *Article (Natural Exp.):* Larsen et al., 2019
Week 4 TU: 1/27 TH: 1/29	- Difference in Difference (DiD) - Lab exercise: DiD case study	- W4: Quiz	- *A&P: Chapter 4* - *Article (DiD):* Moland et al., 2013
Week 5 TU: 2/3 TH: 2/5	- Regression Discontinuity Design (RDD) - Lab: RDD case study	- **HW 2: Posted** - W5: Quiz	- *A&P: Chapter 3*
Week 6 TU: 2/10 TH: 2/12	- Instrumental variables (IV) - Lab exercise: IV case study	- W6: Quiz	- *Article (IV):* Stokes (2015)
Week 7 TU: 2/17 TH: 2/19	- Robustness checks - **Guest Speaker:** Prof. M. Mildenberger	- W7: Quiz - **HW 2: Due 2/23**	- *A&P: Chapter 6* *-Article (Matching):* Schleicher et al., 2019
Week 8 TU: 2/24 TH: 2/26	- Mixed Effects Models (MEMs) - Lab: MEMs in R	- W8: Quiz	
Week 9 TU: 3/3 TH: 3/5	- Case Studies: Design Based Methods - Review	- W9: Quiz	- Article (RDD): Neal, 2024
Week 10 TU: 3/10 TH: 3/12	- Review - Final project check-ins		
Week 11 TBA	**Final project - Group presentations** [TBA]		

Policy on Generative AI

Adapted from policy for EDS 220 & EDS 223, developed by Dr. Carmen Galaz-Garcia & Dr. Ruth Oliver, and UT at Austin's Center for Teaching and Learning

Understanding how and when to use generative AI (GenAI) tools (e.g. ChatGPT) is quickly emerging as an important skill for data science professionals (and beyond). To that end, **you may use GenAI tools in this class as long as it aligns with the learning outcomes or goals associated with assignments**. You are fully responsible for the information you submit based on a GenAI query (such that it does not violate academic honesty standards, intellectual property laws, or standards of non-public research you are conducting through coursework).

Some examples of when the use of GenAI tools *is permitted* in this course include:

- Troubleshooting code or technical issues and understanding error messages
- Clarifying concepts, methods, or documentation
- Iterating on your research question
- Strengthening your prose through revision suggestions
- As a sounding board to explore ideas or approaches

Examples of when the use of GenAI tools *is not permitted* in this course include:

- Relying on AI to complete substantial portions of an assignment in place of your own reasoning and understanding
- Using GenAI output without verifying its correctness or ensuring its alignment with the defined task(s)

You are required to include a *Generative AI Statement of Use (LINK TBA)* with each assignment submission. This statement will take the form of a standardized checklist through which students will indicate all applicable ways generative AI tools were used in the completion of the assignment.

Assignments that include low-effort or unreflective use of GenAI will receive "Incomplete" marks. Not acknowledging use of GenAI in assignments will result in a "Incomplete" mark for the assignment -- additionally, the assignment will not be eligible for revision / resubmission.

Conduct, Inclusion, and Accommodations

Course conduct: We are committed to actively creating, modeling, and maintaining an inclusive climate and supportive learning environment for all course participants (including instructors, guests, and students). We expect everyone to treat every member of our learning community with respect. Harassment of any kind will not be tolerated. Everyone is expected to read and adhere to the UCSB Code of Conduct.

Access & accommodations: 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.

Name and pronouns: Everyone has the right to be addressed and referred to by name and pronouns in accordance with their identity. By default, the UCSB Registrar roster only includes students' legal names**,** but your profile can be updated with pronouns - which I encourage you to do.

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 was inspired and developed by adapting materials from course syllabi authored by Bren faculty Sam Csik and Ruth Oliver.