ESM513: Environmental research design

Fall 2024

Mondays and Wednesdays, 9:30-10:45, Bren 2436

Instructor: Robert Heilmayr
Email: rheilmayr@ucsb.edu
Office: Bren 4402 | Office hours: Tuesday, 2:00-3:00

Course summary

ESM513[1] introduces disciplinary traditions of knowledge creation and explores how these traditions motivate different approaches to research design. Students develop a series of short research proposals on environmental topics to hone their ability to frame effective research questions, and match those questions to appropriate research designs. By giving interdisciplinary environmental scholars a deeper understanding of other disciplines, the class empowers students to engage in more effective interdisciplinary collaboration and communication.

Learning objectives

This course is designed for Bren Ph.D. students in the second year of their doctoral training. It provides a brief introduction to research designs and their epistemological foundations. Upon completion of the course, you should be able to:

- Describe several major philosophies of knowledge and how they relate to research objectives and research design choices.
- Formulate effective research questions.
- Make informed choices regarding research design for the questions you seek to answer.
- Characterize and evaluate the strengths and weaknesses of environmentally related research designs, particularly with regard to the 'fit' between research questions, design, and causal arguments.
- Describe and justify the research design of a specific investigation to a non-specialist.

Course structure

Each week will focus upon a different research design. The different research designs will be explored through three interconnected course elements:

[1] The design of this course borrows heavily from EIPER320, a course taught by Jenna Davis as part of Stanford's Emmett Interdisciplinary Program for Environment and Resources.

- **Readings and classroom discussion** will emphasize the epistemological underpinnings of a research design as well as guidance on its effective application.
- **Faculty speakers** will highlight effective use of a research design in their work. After the seminar, the faculty member will meet with students to discuss the research in greater detail.
- **Research memos** will give students an opportunity to apply different research designs to topics of their choosing. Students will formulate a clear question and outline a research design that could effectively answer the question. Feedback and workshopping will give students guidance on how to refine your research approach.

Course topics

This course covers research designs that are commonly employed by scholars across a variety of disciplines. Although the course will emphasize approaches used by researchers in the Bren School, it will also seek to expose you to epistemological traditions that are less common within Bren. To enable you to delve into the details of each approach to research, we will be joined by guest speakers with experience conducting research in each tradition.

1. Theoretical and conceptual models (Chris Costello)
2. Why trust science? Summary of epistemological traditions.
3. Experiments (Mark Buntaine)
4. Quasi-experiments (Joan Dudney)
5. Simulation models (Naomi Tague)
6. Comparative case studies and epistemology (Summer Gray)
7. Participatory and community engaged research (David Pellow)
8. Indigenous research methods (Alessandra Vidal Meza)

Course expectations

This course's success depends upon thoughtful and active engagement by all students. To achieve this, you will be expected to:

- Complete all assigned reading prior to class.
- Attend all classes and engage in classroom discussion.
- Submit three memos detailing your research ideas.
- Provide constructive feedback on other students' final memos.

I will strive to reciprocate your effort by upholding my own commitments to you:

- I will be understanding of any health or caretaking challenges that arise in your life. Please let me know if you need accommodations to succeed in this class.
- I will clearly communicate the information needed for you to succeed. This means that I will clearly define all assignments and their expectations, and will return constructive feedback on your assignments in a timely manner.

- I will welcome your feedback. This course is a new addition to the Ph.D. curriculum at Bren, and I am eager to refine it based on your insights and experiences.

Readings

I have sought to carefully curate the readings to ensure that they represent a manageable volume of material, while inspiring fruitful conversations. Some readings are still being selected in consultation with the guest speakers, but all required readings will be posted to canvas at least one week prior to the planned class when the topic will be discussed.

Research memos

Throughout the quarter, you will be asked to complete a series of short memos that ask you to apply covered research designs to your own questions. Detailed assignments for each memo will be uploaded to canvas. The planned schedule for these assignments is:

- Memo 1 – model building: Due October 14, 11:59PM
- Memos 2 – testing research designs: Due November 11, 11:59PM
- Memo 3 – research proposal: Due November 27, 11:59PM

Grading

Your final grade will be calculated as follows:

- Participation and attendance: 30%
- Memos: 50% (15% for memos 1 and 2, 25% for the final memo)
- Constructive feedback on classmates' memos: 15%