

ESM 204: Economics for Environmental Management
Bren School, UC Santa Barbara

Spring, 2024

Class: Tuesday/Thursday, 9:30-10:45am. Course webpage: **Canvas**

Instructor: Professor Tamma Carleton (3418 Bren Hall; tcarleton@ucsb.edu)

Prof. Carleton's Office Hours: Mondays, 3:00-4:00

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Nestor's Office Hours: Mondays, 4:00-5:00 and Thursdays, 4:00-5:00

Anonymous Suggestion Box: This course is a work in progress! We welcome your suggestions, concerns or any other comments about the course. You can always talk to us in person, but you can also submit concerns anonymously at any point during the quarter using a Google Form.

Introduction. In this class, we examine the incentives and rationale behind environmental problem solving. Broadly speaking, economics is the science of how scarce resources are allocated: how people and firms behave, the consequences for resource use and conservation, and how society might want to make decisions about scarce resources. Economics therefore provides a useful framework within which to analyze environmental problems and approaches to solving them. Many environmental problems are caused by economic activity (e.g., carbon emissions, overharvesting renewable resources) and have differentiated effects on diverse populations (e.g., the global poor are most vulnerable to climate change, air pollution exposure in the US disproportionately affects minority communities). Thus, we will examine different approaches to influencing human behavior and the unequal implications of those interventions.

To do so in a meaningful way will require a lot of work. The pace will be quick and the out-of-class workload will be heavy (expect an average of 6-8 hours of work per week outside of class.) The purpose of the course is to give you a solid foundation in those aspects of economics and quantitative policy analysis that are important to environmental and natural resource management and policy. A major goal of the course is to equip you to think carefully and constructively about how different kinds of policies or interventions could affect environmental outcomes and human wellbeing. The course will serve as the foundation in economics for management, economics, and policy electives in the Bren School.

There will be readings prior to some class meetings and homework assignments (projects) due about every other week. There will be a total of 4 assignments. The course website will contain all details for these assignments.

Grading. The course requirements are a midterm (20%), final exam (20%), four homework assignments (40%), and an essay, including a peer-reviewed proposal (20%). The midterm will be in-class (Thursday, May 2) and the final will be held during the last day of class (Thursday, June 6). The essay is due by 10:00 pm on Monday, June 10 (first day of finals week). The exams are open note and open book. Class attendance is mandatory; if you have to miss class, you must obtain approval from Professor Carleton prior to the start of class. If you miss a class without prior approval, your grade will be reduced by 5%. Late work will receive a zero unless you obtain prior approval.

Lectures. Lectures are Tuesday and Thursday mornings, as scheduled. Lecture slides will be available prior to the lecture on Canvas. These slides are intentionally brief. We will regularly use the white board to explain concepts so you will likely want to take notes during lectures.

Readings. Because class content and homework assignments are highly involved, we limit required readings in this course. You are not required to purchase any particular textbook. However, you are responsible for learning the material covered in class. In many cases, you will need to do outside reading to fully grasp the material covered in class. You are expected to be able to seek out that material on your own, although we are happy to help guide you. Two good all-around environmental economics textbooks we recommend are:

- *Environmental Economics* (2nd Edition) by Charles Kolstad, available in the UCSB Library
- *Markets and the Environment* (by Nathaniel Keohane and Sheila Olmstead), [available online](#) via UCSB Library

Other readings (such as newspaper or journal articles) will be made available on the webpage.

Other good textbook resources include:

- Boardman et al: *Cost-Benefit Analysis*, 2nd Ed (Prentice-Hall, 2001)
- Hartwick and Olewiler: *The Economics of Natural Resource Use*, 2nd Edition (Addison-Wesley, 1998)
- Thomas Sterner, *Policy Instruments for Environmental and Natural Resource Management* (Resources for the Future, Washington, 2002).
- A book that covers much of the material in the course at an elementary level is Goodstein: *Economics and the Environment* (any edition).

Assignments. There are four homework assignments. Each assignment asks you to use the tools developed in the course to help resolve a timely environmental problem. Figuring out **how to approach the question** is an important part of the course. You can work in a group of **up to three** people for each assignment. You must have a different group for each assignment. Your group should submit a single assignment with all group members' names on it, and you should not share work across groups.

Essay. Detailed essay guidelines can be found on Canvas. A short essay proposal is due May 9. This proposal should explain the environmental problem you are interested in writing about and discuss possible concepts and tools from class that may help solve it. Proposals will be peer-reviewed; your review of your peer's proposal is due May 16.

Honor Code, Joint Work, and chatGPT. Collaboration with your homework/project partners (who change with every assignment) is encouraged. But it is also important to find a path to a solution on your own, so please do not share answers across groups. It goes without saying that the exams are your own individual work and you are on your honor to execute your exam individually and neither give nor receive aid. Plagiarism will be treated very seriously and will involve reporting to the UCSB graduate division. chatGPT and other generative AI tools are an exciting new resource that may, at times, help you understand concepts from lectures or prepare for exams. However, these tools are **not** allowed to be used for homework, nor (obviously) on exams. We also caution that these tools often struggle to accurately interpret and respond to the types of economics questions we ask in this course, many of which rely on drawing and interpreting graphs, translating text to conceptually-grounded equations, etc. We recommend that you use them lightly and rely instead on course materials and recommended textbooks.

Prerequisites. You are assumed to be well-versed in calculus, statistics, and ideally, to have had some exposure to basic microeconomics. You are also expected to be conversant with Excel and R or suitable substitutes. The first assignment is designed to help you learn how to use R to solve the kinds of problems we will tackle in this class.

Getting extra help: Come to office hours! This is a challenging course. Please communicate with us if you're having a hard time keeping up and we will help get you the support you need to succeed.

Course Outline: The first several lectures introduce the tools we need for policy evaluation and to help evaluate environmental "solutions". These are applicable across a wide range of environmental issues. We then invoke those tools to address specific classes of environmental problems and related topics.

Schedule (subject to minor modifications – final schedule is on Canvas):

1. (April 2): Introduction to the course and environmental economics
2. (April 4): HW #1 distributed. Supply, demand, equilibrium, and R.
3. (April 9): Supply and demand, continued.
4. (April 11): Measuring costs and benefits
5. (April 16): HW #1 due. What happens when the market fails? Externalities.
6. (April 18): HW #2 distributed. How can we fix market failures? Correcting externalities.
7. (April 23): Public goods
8. (April 25): Can a market solve a market failure? Environmental markets
9. (April 30): HW #2 due. Finish lectures and review for midterm
10. (May 2): Midterm in class.
11. (May 8): HW #3 distributed. Who benefits and who is harmed by environmental interventions? Environmental inequality.
12. (May 7): The role of time in environmental problems and solutions
13. (May 9, guest lecture TBA): Essay proposal due
14. (May 13**, 8am): Making decisions under uncertainty (HW #3 due May 14th 9:00am)
**Note that this is a Monday 8am class swap with Jim Salzman's law course
15. (May 16): Essay peer review due, HW #4 distributed. What is nature worth? Non-market valuation
16. (May 21): An economist's tool for measuring nature's value: revealed preference
17. (May 23): Economic growth and sustainability
18. (May 28): International trade and the environment
19. (May 30): HW #4 due. Slack time to finish up lectures
20. (June 3**, 8am): Review for Final.
**Note that this is a Monday 8am class swap with Jim Salzman's law course
21. (June 6): Final Exam in Class
22. (June 10): Essay due by 10:00 pm

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.

Access and Accommodations: Please submit requests for DSP accommodations early. 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.

The text below is provided by the UCSB Disabled Students Program.

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)

Food insecurity: <http://food.ucsb.edu/> includes the Cal Fresh Program <http://food.ucsb.edu/calfresh> and the Associated Students food bank <https://foodbank.as.ucsb.edu>

Resource Center for Sexual and Gender Diversity (RCSGD) in the SRB, offers a host of services for LGBTQI+ students including a library and many events throughout the year. <http://rcsgd.sa.ucsb.edu/>

Dream Scholars/Undocumented Student Services Program offers workshops, helps students find scholarships and financial support as well as providing community for our undocumented students. <http://www.sa.ucsb.edu/dreamscholars/home>

Campus Learning Assistance Services (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) 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), 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) 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/>