

ESM 204: Economics for Environmental Management
Bren School of Environmental Science & Management University of California at Santa Barbara
Spring, 2021

Class: Monday/Wednesday, 8:00-9:15 ([Zoom Link](#)). Webpage: gauchospace.ucsb.edu

Sections: See Class Schedule

Instructors: Professor Tamma Carleton (3418 Bren Hall; tcarleton@ucsb.edu) &
Professor Christopher Costello (4410 Bren Hall; costello@bren.ucsb.edu)

Prof. Carleton's Office Hours: Wednesday 3:00-4:00. [Zoom Link](#).

Prof. Costello's Office Hours: Tuesday 3:00-4:00. [Zoom Link](#).

Teaching Assistant: Vincent Thivierge, PhD student in Bren (vthivierge@bren.ucsb.edu).
Vincent's Office Hours: 3:30-4:30pm Mondays. [Section and OH Zoom link](#).

Anonymous Suggestion Box: Suggestions, concerns or any other comments about the course can be submitted anonymously during the quarter using [this form](#).

Introduction. The main purpose of this class is to show how economics can be used to help solve environmental problems. We will introduce economics from a practical, problem-solving point of view. 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. Thus, economics can provide a useful framework within which to analyze environmental problems and approaches to solve them. Because many environmental problems are caused by economic activity (carbon emissions, overharvesting renewable resources, toxic releases as a by-product of industrial production, urbanization), we will examine different approaches to influencing human behavior and therefore the externalities associated with it.

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 fairly 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. The course will also serve as the foundation in economics for management, economics and policy electives in the Bren School.

There will be readings prior to most 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 (25%), final exam (30%), four homework mini assignments (40%), and an essay (15%). The total is 110%, so this effectively builds in the possibility of 10% extra credit. The midterm will be in-class (Wednesday, April 28) and the final will be held during the last day of class (Wednesday, June 2). The essay is due by 10:00 pm on Friday, June 4. The exams are open note and open book. Class attendance is mandatory; if you have to miss class, you must obtain approval from Professor Costello or Carleton prior to the start of class. If you miss a class without prior approval, you will be penalized by 5%. We will make use of Zoom features such as breakout rooms and polls, to test your understanding of the material and track your interests.

Lectures. All lectures will be delivered live via Zoom at the appointed time. Lecture slides will be available prior to the lecture on the class webpage. These slides are intentionally brief. We will regularly use the “white board” feature of Zoom to address new topics.

Readings. Readings are drawn from multiple sources. **We will highlight readings that will be specifically discussed in lecture.** 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. For example, a good all-around environmental economics textbook is:

- *Environmental Economics* (2nd Edition) by Charles Kolstad.

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.

Honor Code and Joint Work. 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.

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 R or a suitable substitute. If not, please take the time to learn the basics.

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 Gaucho Space):

1. (March 29, Costello): Introduction + Principles of Economics
2. (March 31, Costello): HW #1 distributed, Supply and Demand, Market Equilibrium
3. (April 5, Costello): Measuring Costs & Benefits
4. (April 7, Carleton): Market Failures & Externalities
5. (April 12, Carleton): HW #1 due, Externalities
6. (April 14, Carleton): HW #2 distributed, Correcting Externalities
7. (April 19, Costello): Public Goods
8. (April 21, Costello): Regulation with Taxes and Environmental Markets
9. (April 26, Costello): HW #2 due. Other Regulatory Options including private provision of public goods
10. (April 28): Midterm Today
11. (May 3, Carleton): HW #3 distributed, Incidence

12. (May 5, Carleton): Discounting
13. (May 10, Carleton): Risk and Uncertainty
14. (May 12, Carleton): HW #3 due, Growth & Sustainability
15. (May 17, Carleton): HW #4 distributed, Non-market Valuation & Benefit Transfer
16. (May 19, Costello): Stated Preference Approaches
17. (May 24, Costello) Revealed Preference Approaches
18. (May 26, Costello): (HW #4 due on **May 28**), Trade
19. (May 31, 2021 is a University Holiday)
20. (June 2 - last day of class): Final Exam Today
21. (June 4 - Essay due by 10:00 pm)