Introduction. The main purpose of this class is to show how economics can be used to understand the origins of and 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 from industrial production, loss of biodiversity), 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 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 (Wednesday, April 27) and the final will be held during the last day of class (Wednesday, June 1). The essay is due by 10:00 pm on Friday, June 3. 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 and/or Carleton prior to the start of class. If you miss a class without prior approval, your grade will be reduced by 5%.

**Lectures.** All lectures will be held in person at the appointed time in Bren Hall 1414. 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 to explain concepts so you will likely want to take some notes during lectures.

**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:


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

Other good textbook resources include:


• 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 Gauchospace. A short essay proposal of 1-2 paragraphs is due May 4. 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 9.

**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 Gaucospace):

1. (March 28, Costello): Introduction + Principles of Economics
2. (March 30, Costello): HW #1 distributed, Supply and Demand, Market Equilibrium
3. (April 4, Costello): Measuring Costs & Benefits
4. (April 6, Carleton): Market Failures & Externalities
5. (April 11, Carleton): HW #1 due, Externalities
6. (April 13, Carleton): HW #2 distributed, Correcting Externalities
8. (April 20, Costello): Regulation with Taxes and Environmental Markets
9. (April 25, Costello): HW #2 due, Review for Midterm
10. (April 27): Midterm Today
11. (May 2, Carleton): HW #3 distributed, Incidence
12. (May 4, Carleton): Essay proposal due, Discounting
13. (May 9, Carleton): Essay peer review due, Risk and Uncertainty
14. (May 11, Carleton): HW #3 due, Growth & Sustainability
15. (May 16, Costello): HW #4 distributed, Unintended Consequences of Environmental Interventions
16. (May 18, Costello): Non-market Valuation & Benefit Transfer, Stated Preference Approaches
17. (May 23, Carleton) Revealed Preference Approaches
18. (May 25, Carleton): (HW #4 due on May 27), Trade
19. (May 30, 2021 is a University Holiday)
20. (June 1 - last day of class): Final Exam Today
21. (June 3 - Essay due by 10:00 pm)