Connecticut College
ECO|ES 212: Environmental Economics[†]
Spring 2023 (1/23 - 5/17)

Professor:	Pierce Donovan	pdonovan@conncoll.edu
Lectures:	Fanning 101	MWF 9:00 am - 9:50 am
Office Hours:	Winthrop 305	MWF 10:00 am - 11:00 am
		TR 10:30 am - 11:30 am

Course Description and Objectives

At its core, economics is a discipline focused on allocating scarce resources. This extends to natural resources, naturally! In fact, a strong foundation in economics is essential for tackling environmental issues, and I'll be using this course to back up my claim. Since the most pressing challenges that humanity faces today concern how we choose to interact with the environment, it's a good thing that you've chosen not to sleep on environmental economics.

Economics provides a framework for making trade-offs between competing values. Freshwater can be used for irrigation or hydropower, or put in bottles—*or* it can be left alone in its natural state in rivers and aquifers. There are good reasons to allocate water to each "bin." But without a complete understanding of the benefits and costs of each use, we create unnecessary waste.

These trade-offs help identify solutions for natural resource management, but not everyone views these trade-offs the same way. In this course you'll begin to view the world through the lens of an environmental economist—a lens hyper-focused on identifying the incentives driving sub-optimal behavior and developing policy that confronts the cause of a problem (rather than mitigating its consequences). You'll learn about the history of natural resource management from an economic perspective and become an informed critic of current environmental policy debates concerning land use, fisheries, forestry, oil extraction, pollution control, and many other topics.

Expectations

Introductory Microeconomics (ECO 112) is the only prerequisite, and I expect you to have mastered that material. Additionally, ECO 212 assignments cannot be prepped for and completed solely in the 11^{th}-hour. You should read ahead of schedule and start assignments early—this will make your experience much more enjoyable, too. And while I want you to become deliberate, thoughtful, and convincing writers and speakers, effective persuasive skills aren't something that develop passively. It takes lots of practice and revision.

Most of the material in this course isn't conceptually-difficult or math-heavy, but it still takes effort to transition from passive lecture bystander to active participant. You'll want to take some time to practice explaining the logic/ideas/graphs from lecture to friends outside of ECO 212—you'll spot any gaps in your understanding and learn how to apply environmental economics more effectively—both in class and in the future.[††]

[†] As the semester goes on, I may change the contents of this syllabus regarding the schedule, grading, or other details.

[††] At a higher-level, courses like ECO 312: *Natural Resource Economics* further justify economic arguments with rigorous mathematical modeling. After 212, you may appreciate the more detailed perspective that the models can provide.

Textbook and Readings

Most of my lecture material will follow the direction of this book:

Markets and the Environment, Second Edition, 2016
- By Nathaniel O. Keohane and Sheila M. Olmstead

The book is required for the course, and it's available online via OneSearch from the Connecticut College Library. Most lessons and assignments will also require readings from other sources. Take a look at them *before* each lecture; the best way to follow along in class is to understand where we're heading in advance. For the reading schedule, see the course outline at the end of the syllabus.

I'll use `Moodle` to post all resources (slides, readings, assignments, grades, etc.) for the course. On `Moodle`, you'll use a communal annotator—`hypothes.is`—to take notes on the assigned readings before each class. From past experience, this tool has increased engagement with the readings and fostered more dialogue during class. Your involvement here will give you credit toward your participation grade. This may be a good alternative for those who don't like speaking up at 9am.

Grading

I don't *give* grades, you *earn* them. Further, I don't judge your performance relative to your peers (i.e. curve your grades) during the term in order for you to have the clearest signal about your performance. I look for a proven understanding of the material via the following:

10%	Class Participation (class engagement, office hours questions, `hypothes.is`, etc.)
30%	Homework Assignments (x3, completed in pairs)
30%	Teaching Demonstrations (x2, in person, solo)
30%	Term Project (completed in pairs):
$\sim$ 10%	Topic Proposal
$\sim$ 5%	Peer Review
$\sim$ 5%	Presentation
$\sim$ 10%	Homework Problem

Grades for written work and presentations can sometimes feel subjective, so here's a formalization:

A (∼90) You demonstrated a strong understanding in the subject at hand. Your answers provide an interesting/personal/insightful/detailed take beyond regurgitating course material.

B (∼80) You connected the dots and answered my questions satisfactorily. Information from lectures, the text, and readings were brought together to build a clear and coherent response.

C (∼70) You missed a bit of low-hanging fruit. Some of your responses didn't quite "get there," and some crucial/expected elements of a correct answer were missing.

D (∼60) You didn't demonstrate an adequate understanding of the material. There were erroneous/unsupported statements or incomplete answers in your work.

F (0) You either didn't submit anything, or you *did* but that work didn't address the questions at hand or included plagiarized work.

Homework Assignments

There are three assignments due earlier in the course, always due on the Monday following a unit (submitted to `Gradescope`, as a PDF, at 9am—more instructions on `Moodle`). I encourage you to discuss the assignments together or with me, and you *must submit each assignment with a partner*. Late assignments will be accepted for three days, with a ten percentage point penalty per day.

I use these early assignments to nudge you toward "thinking like an environmental economist," which is a bit more focused than merely explaining that there are issues with how we manage our natural resources. As it turns out, the problem is usually self-evident. We want to write policy to fix it—which requires an understanding of the underlying [economic] incentives at work. This will set you up for the term project, which is meant to complete your transition from "student in an intro environmental economics class" to "person who can explain what environmental economics is to your extended family"—if that's something you wanted to attempt, anyway.

Exams

You will conduct two "teaching demos" in this course. In the first, you will have ten minutes in my office to walk through roughly a slide's worth of material from one of my lectures. The second will involve answering a problem of your choosing from a pool of 5-10 questions. The goal of these active learning assessments is to have you move beyond the boring and passive educational framework of "memorize—regurgitate" and facilitate a more thoughtful and fulfilling learning experience. These exams will be self-scheduled, and the exam prompts will be located on `Moodle` well ahead of time.

Term Project

This project is a deeper exploration into a related question of your choosing. We build up to the final product in stages. Below is the general progression, and a separate *Term Project Timeline* document can be found on `Moodle`. The goal of this assignment is to apply what you've learned in class to a new environmental issue and come up with a policy solution consistent with economic principles.

1. With a partner, find a particular environmental issue and setting of interest and write a summary of the issue. Why is it important? Who/what is involved? How could you apply the content from my lectures to your story?
2. Discuss the nature of the issue using what you've learned (so far) about environmental economics. Is there a behavioral problem? An issue with institutions/market failure? A lack of research or incomplete policy? What policy solutions might be available?
3. Present your thoughts in class. It's important to talk about your work; expressing your thoughts to a captive audience is helpful for testing out ideas and finding future direction.
4. Consider a potential "homework problem" that would help another student understand your environmental issue—and how to address it. A good question doesn't just cover the material; it delivers its own lesson. Use my homework assignments as a guiding framework.
5. Reflect on your analysis. Think about how your thoughts regarding environmental management have changed since starting this course. Use that to write something accessible to someone outside of this class (perhaps your parents).

Not Boilerplate (please take a moment to read)

- Missing lecture isn't the end of the world. For example, if you feel sick, please don't come to class, recover, and get notes from a friend. I don't need an excuse, but be in touch if you will be out for multiple days. Chronic *undocumented* absences may result in course failure.
- Come to office hours! They're there for you! Asking clarifying questions about my material or assignments and talking with me about your interests beyond my courses are both good habits to start and can greatly improve your college experience (or a recommendation letter).
- When asking for help outside of class, the best students show me how they have approached a problem and their progress up to that point. Simply asking for an answer is not a productive use of our time. I hope to facilitate critical thinking, and that takes effort on everyone's part.
- While I'll be accessible by email, I strongly prefer communicating during class/office hours. Regarding boundaries, I do not plan on answering emails late at night or on the weekend.
- There are lots of things to learn in college besides my material, and there are lots of ways to optimize your learning experience. The Academic Resource Center (`link`) can assist you in getting the most out of your time and effort at Connecticut College.
- I can't recommend the tutoring services at the Roth Writing Center (`link`) enough if you want to work on clear and coherent communication. Focused writing takes practice, and college is a great time to put in the hours.
- If you have a learning disability or a physical disability that requires accommodation, please let me know as soon as possible. For more information on accommodation, you can contact Student Accessibility Services (`link`).
- I will not tolerate academic dishonesty. You can review Connecticut College's Honor Code [`here`]. I will report any suspected cheating, plagiarism, manipulation, or other misconduct.
- You do not have permission to make any form of recording during class or office hours (with the exception of those granted accommodations through Student Accessibility Services). You also do not have permission to share or publish my course materials (lecture notes, homework answers, exams)—or any derived content like your responses to homework and tests.
- You are responsible for your technology problems. Submit assignments well ahead of the due date if you want to be sure that your submission is received/in the proper format/etc.
- Please be respectful to your classmates. Refrain from talking during class if it is not relevant to lecture or discussion. Cell phone or tablet use should not detract from your ability to follow along with class. No activity on your part should undermine the efforts of other students.
- If you have any issues within or outside this course that are affecting your work, and you lack someone to talk to, I will do my best to help. Keep in mind that I am a mandatory reporter under Title IX, and will need to report information regarding gender-based discrimination or sexual misconduct if you choose to share it with me. In cases where I'm not the appropriate resource, please seek support from Student Counseling Services (`link`).
- In my contribution towards an inclusive and intellectually-vibrant community, I aim to reflect the ideals presented in our school statements on Freedom of Expression (`link`) and Principles of Community (`link`) in my capacity as a professor at Connecticut College. I hope you do too.

Course Outline

Foundations for Environmental Economics

Introduction to ECO 212 (and me) [and you] ..... Monday, 1/23

The role of economics in environmental management ..... Wednesday, 1/25

Book: Chapter 1, pp. 9-10
Reading: *An economic perspective on environmental and resource management*, Oates
Concepts: stewardship, constraints, scarcity, trade-offs

Economic efficiency and environmental policy ..... Friday, 1/27

Book: Chapter 2
Concepts: maximizing net benefits, equi-marginal rule

The benefits and costs of environmental protection ..... Monday, 1/30

Book: Chapter 3, pp. 35-55
Concepts: willingness-to-pay, revealed and stated preference methods, contingent valuation, hedonics, travel-cost methods, shadow values

Critiques of benefit-cost analysis ..... Wednesday, 2/1

Book: Chapter 3, pp. 55-68
Reading: *The value of a statistical life and coronavirus, with Alan Krupnick*, Raimi
Concepts: inputs to policy, efficiency vs equity, discounting, uncertainty, VSL

Markets–and market failure ..... Friday, 2/3

Book: Chapter 4, Chapter 5, pp. 80-91
Concepts: market completeness, unintended/uncompensated effects, social costs/benefits

Externalities and public goods ..... Monday, 2/6

Reading: *New York City steps up*, McConnell and Krupnick
Reading: *Shifting sands: Using taxes to build the best beaches, with Megan Mullin*, Raimi
Reading: *China limited the Mekong's flow. Other countries suffered a drought.*, Beech
Concepts: rivalry and excludability, competing values, free-riding, public amenities

The tragedy of the commons ..... Wednesday, 2/8

Book: Chapter 5, pp. 91-98
Reading: *Barbed wire entrepreneurship*, PERC
Reading: *Are unauthorized foreign vessels deterred from fishing inside EEZs?*, Englander
Concepts: selfishness, institutions, property rights, Coase theorem

Foundations discussion day ..... Friday, 2/10

Reading: *To tax or not to tax? The answer may surprise you*, Spiller and Stephens

Non-Renewables and Energy

What is land worth? ..... Monday, 2/13

Reading: *L.A. country club pays ultra low property tax rate*, Romero
Concepts: scarcity, rents, land use, opportunity cost, asset value
Homework #1 due.

Pollution ..... Wednesday, 2/15

Book: Chapter 10, pp. 200-207, 208-210, 217-220
Reading: *Learning from thirty years of cap and trade*, Schmalensee and Stavins
Reading: *Pollution is killing Black Americans*, Villarosa
Concepts: cost-effective emissions reduction, distributional impacts

Command-and-control policies ..... Friday, 2/17

Book: *Skim* Chapters 8-10
Reading: *Upending conventional wisdom on carbon pricing in the power sector, with Ryan Kellogg*, Raimi
Reading: *Cap and Trade-Offs*, Johnson
Concepts: deadweight loss, Pigou, marginal damage, cost-effectiveness, flexibility, validity

No class (*teaching demo time*) ..... Monday, 2/20

Teaching Demonstrations throughout this week.

No class (*more teaching demos*) ..... Wednesday, 2/22

No class (EEA conference) ..... Friday, 2/24

Electricity ..... Monday, 2/27

Reading: *The next energy battle*, Penn
Reading: *Renewable energy certificates, explained*, Roberts
Reading: *How dairy farmers are cashing in on California's push for cleaner fuel*, Smith
Concepts: utilities, energy generation, energy efficiency

Optimal extraction of a non-renewable resource ..... Wednesday, 3/1

Book: Chapter 6
Reading: *Why gas prices are so high*, Koeze and Krauss
Concepts: dynamic efficiency, intertemporal arbitrage, marginal user cost, Hotelling rule

Causes and consequences of sub-optimal extraction ..... Friday, 3/3

Reading: *The economic impacts of agricultural groundwater markets*, Bruno
Concepts: market power, non-excludability, protection/stability

Non-renewables discussion day ..... Monday, 3/6

Homework #2 due.
Reading: *Why Galesburg has no money*, Hicks

Renewables

Seminar on writing better presentations ..... Wednesday, 3/8

Guest: Noel Garrett, Academic Resource Center

Term Paper Brainstorming Session ..... Friday, 3/10

No class (Spring Break) ..... Monday, 3/13

A little bioeconomics ..... Monday, 3/27

Book: Chapter 7, pp. 128-138
Concepts: fisheries, open-access, logistic model, carrying capacity, steady-state
Proposal due.

Regulated open-access fisheries ..... Wednesday, 3/29

Reading: *The texture of rents*, Wilen, pp. 1-12
Reading: *The world can't keep fishing like this*, Allgeier and Punke
Concepts: rent-dissipation, derbies, over-capitalization

Individual fishing quotas ..... Friday, 3/31

Book: Chapter 10, pp. 207-214
Reading: *The texture of rents*, Wilen, pp. 12-29
Reading: *A famed fishing port shudders as its Codfather goes to jail*, Bidgood
Concepts: IFQ/ITQs, wealth creation, cost-minimization, new market generation

Introduction to forestry ..... Monday, 4/3

Book: Chapter 7, pp. 114-118
Concepts: quasi-renewable, mean/current annual increment, Wicksell rotation

Optimal forest rotation ..... Wednesday, 4/5

Book: Chapter 7, pp. 118-122
Reading: *Thousands of Southerners planted trees for retirement. It didn't work.*, Dezember
Concepts: Faustmann rotation, site value, dynamic efficiency

Non-timber values ..... Friday, 4/7

Book: Chapter 7, pp. 122-128
Concepts: ecosystem management, carbon sequestration, foraging

Renewables discussion day ..... Monday, 4/10

Reading: *As the Great Salt Lake dries up, Utah faces An 'Environmental Nuclear Bomb'*, Flavelle
Homework #3 due.
Peer review due.

Conservation

Endangered species protection ..... Wednesday, 4/12

Book: Chapter 10, pp. 224-229
Reading: *Carving out some space*, Boyd, Caballero, and Simpson
Concepts: the ESA, tradable development rights, mitigation/conservation banking

Ecosystem services ..... Friday, 4/14

Reading: *Green growth that works: Discussing ecosystem services, with Lisa Mandle*, Raimi
Concepts: natural capital, green infrastructure, non-market valuation

No class (*teaching demo time again*) ..... Monday, 4/17

Teaching Demonstrations throughout this week.

No class (*more teaching demos*) ..... Wednesday, 4/19

The effects of invasive species ..... Friday, 4/21

Reading: *Can genetic engineering bring back the American Chestnut?*, Popkin
Concepts: natural experiments, international trade, blights, "pest control"

Non-market valuation ..... Monday, 4/24

Reading: *Measurement of recreation benefits*, Trice and Wood
Concepts: travel cost method, hedonic pricing

Integrated assessment modeling ..... Wednesday, 4/26

Reading: *The strategic costs of carbon emissions*, Wichman
Reading: *The new social cost of carbon*, Auffhammer
Concepts: intergenerational utility, social damage, social cost of carbon

Western water ..... Friday, 4/28

Reading: *Wall Street eyes billions in the Colorado's water*, Howe
Reading: *The largest dam-removal in US history*, Matthews
Concepts: CA water management, settlement, irrigation, theft

Conservation discussion day ..... Monday, 5/1

Reading: *Economics in the age of environmental policy, with Robert Stavins*, Raimi
Concepts: climate change, social justice, power generation, sustainability

Term Paper Presentations

Presentations through the end of the course ..... Wednesday, 5/3

Term project wrap-up ..... Monday, 5/15

Book: Chapter 12
Homework Problem due.