# University of New York at Stony Brook
# Economics 373.30
# Economics of Environmental and Natural Resources
Summer 2024

## Instructor and Contact Information


Instructor: Siyuan Lyu
Office Hours: Thursday 6:00 PM -- 9:00 PM (via Zoom)
Meeting ID: 941 7079 8905
Passcode: 431670
Zoom link:
https://stonybrook.zoom.us/j/94170798905?pwd=V9caG5EZjio0tVdUKV04nTMy8fDbBi.1
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## Course Information

Time: Jul 8, 2024 -- Aug 17, 2024 (asynchronous)
Location: Online

## Course pre-requisites

C or higher in ECO 303 and ECO 305.

## General Education and University Credits

Credits: 3
DEC: H
SBC: STAS

## Required Textbook

- *Tietenberg, T. and Lewis, L., Environmental & Natural Resource Economics, 11th Edition*

The course mostly follows this textbook and all the topics covered in class are also covered in the textbook (although not always at the same level of detail). Previous editions of the textbook are also fine.

## Course Delivery/Modality

This is an asynchronous, online course, delivered in the Brightspace. Students must be mindful of all course expectations and due dates. All assignments and course interactions will utilize internet technologies. See the "Technical Requirements" section below for more information. The official time zone for this course is **EST, Eastern Standard Time (US East Coast)**.
All deadlines will be indicated using EST so please keep this in mind especially if you are in a different time zone.

## Course Description, Objective and Topics

**Course Description:** This course is designed to provide an introduction to Environmental and Natural Resources Economics. While the focus of this class is mainly theoretical, empirical examples are used to aid the understanding of concepts. Analysis of economic policies designed to deal with environmental problems. Issues involving the management of renewable and exhaustible resources such as timber and oil as well as the advantage of market-based solutions over the conventional demand approach are discussed.

**Learning Objectives:** Students completing this course will be able to:

- Conduct a Cost-Benefit Analysis for Environmental Policy and apply it to real world examples.
- Place a dollar value on the environment by using different valuation methods.
- Distinguish between renewable, depletable, and recyclable resources of resource taxonomy.
- Analyze how to efficiently allocate a scarce depletable resource over time using a two-period graphical model.
- Analyze the economic feasibility and effects of resource extraction under a cartel (monopoly) and a competitive market.
- Describe the history of price regulation, the price elasticity and income elasticity of demand, in the case of natural gas, oil, virgin ores, freshwater, land, and forests.
- Explain different ways of pollution categorization. Analyze cost-effective pollution control and policy options for pollution control.
- Explain the science of climate change, including both the sources and likely outcomes of climate change. Evaluate different policy options for climate change, as well as policy timing.
- Distinguish between maximum sustainable yield and static-efficient sustainable yield, by developing Schaefer model.
- Explain the relationship between economic growth and the welfare of the population.

**Structure of Course Topics:**

- Week 1: The Economic Approach; Cost-Benefit Analysis
- Week 2: Methods for Environmental Valuation; Dynamic Efficiency and Sustainable Development
- Week 3: Depletable Resource Allocation; Renewable Resources; **Midterm 1**
- Week 4: Recyclable Resources; Water
- Week 5: Land; Forests
- Week 6: Economics of Pollution Control; Climate change; **Midterm 2**; **Optional Final**

The weekly schedule of topics together with the relevant textbook chapters is provided below. This is tentative and provided to give you an overview of what's coming. You are expected to check Brightspace **weekly** for updates during the course.

## Assessment

**Grading:** There will be problem sets and discussion questions for each week, and two midterm exams, which will be non-cumulative. There will be an optional final, which will be cumulative, covering all the chapters discussed in the class. You must finish all the assignments AND attend the exams. Discussion participation will make up 10% of your total grade, and assignments will make up 40%. The exams will count for the other 50%. If you miss more than one exam, you will have to take the course again.

**Discussions (10%):** There will be discussions posted on Brightspace -> Discussions. You are required to answer the discussion questions carefully and reply to at least one of your classmates' answers. There is also a general discussion section. You can post questions as well as answer others' questions.

**Assignments (40%):** There will be 4-5 assignments. You are required to hand in your assignments by due date. The assignments will help you to prepare for the exams, you should take them seriously. They will also help you to see if you understand the material covered in the lectures.

**Exams (50%)**: Exams are closed book and closed notes. During the exam, you are required to login zoom and keep your videos open until emailing me your answers. For each exam, you can use a simple or a scientific calculator. No graphics or programming calculators or any other gadgets such as cell phones, tablets etc. will be allowed. If you miss one of the midterms with acceptable reasons, you must attend the final. Otherwise, the final will be optional. If you attend all three exams, two highest grades of your grades in exams will be used to calculate your final grade. Exams will not be returned, but you are more than welcome to come during office hours to check your exams and discuss how you can improve on the material. If you want a regrade, you can submit a brief statement in writing explaining your concern or why you think a reconsideration of your work is appropriate within three class days of the day the grades are posted.

**The dates and times for exams**
*If you cannot make one of these dates/times you have to inform the instructor one week prior to the exam date, otherwise you will end up with a zero grade for the exam.*

**Exams are held via Zoom, please make sure that you are available to good internet connection during the exam time.**

Midterm 1: Friday, July 26, 9:00am- 10:30am EST
Midterm 2: Friday, August 16, 9:00am-10:30am EST
Optional Final exam: Sunday, August 18, 9:00am-10:30am EST

*You are expected to complete all assignments, discussion forums, and exams on your own. Any evidence of cheating, plagiarism or collaboration with others will be reported to the Academic Judiciary with a recommendation of an F for the class.*

**Academic Dishonesty Policy:** *We take academic integrity very seriously.* You are expected to complete assignments **on your own**. Any assignment submission suspected of cheating (identical or near identical to a classmate or solicited from someone else) will be reported to the Academic Judiciary with a suggested penalty of F for the class and potentially further repercussions for your standing in the university. The same applies to anyone attempting to cheat during an exam, including not following the rules about closed books and allowed calculators.

## How to Succeed in the course

**Weekly Responsibilities**: You are expected to check Brightspace at least once a day for posted announcements and documents. You are required to complete all the tasks in that week by the deadline: **Sunday 11:59 AM EST**. Late assignments will be given a penalty depending on the time of submission. The tasks in a typical week will include

1. Reading the relevant materials/ lecture slides and watching recordings under Brightspace -> Content
2. Completing the assignment on Brightspace ->Assignments
3. Completing the discussion board on Brightspace->Discussions

**Course Related (academic) Help:** You have a lot of options for help with the course material. You can attend my office hours and send me emails. An additional way to obtain answers to questions is by posting a question on the Discussion Board on Brightspace. For questions on the weekly material, go to the corresponding week's forum and post your question. For general questions about the syllabus, the exams, etc., you should post your question in the General Forum. You also have the option to post anonymous Comments and Feedback. Feel free to state what you don't like about the course and to suggest alternatives, but remain polite and respectful.

**Communication Competency:** You are expected to follow certain rules in your written communications through email and on the discussion board on Blackboard. Always make sure you state your name and surname (except for anonymous posts on the Comments and Feedback Discussion Forum). Make every effort to use correct grammar, spelling and punctuation and avoid using all capital letters in your posts and emails. Most importantly, **make sure your posts are polite and respectful**. Abusive language will not be tolerated. The following provides some general guidelines for all communication:

- Remember that, in the absence of face-to-face communication, it's easy to misunderstand what is being said;
- Carefully review and read materials that you receive electronically to ensure that you fully understand the message;
- Be sure to carefully re-read and understand what you will be sending in order to ensure that you are not misunderstood by anyone;
- Avoid cluttering your messages with excessive emphasis (stars, arrows, exclamations);
- If you are responding to a message, either include the relevant part of the original message in your message, or make sure refer to the original's contents so as to avoid confusion;
- Be specific and clear, especially when asking questions;

- If your messages can be typed in UPPER and lower case, please use the two appropriately instead of all UPPERCASE characters. This gives the appearance of shouting and makes the message less readable;
- Remember that not all readers have English as their native language, so make allowance for possible misunderstandings and unintended discourtesies;
- Do not abuse new users of computer networks for their lack of knowledge;
- Follow the same standards of politeness as you do in any other aspect of your life.

**Technical Requirements and Assistance**
D2L Brightspace is Stony Brook University's digital learning environment. It is used for the facilitation of communications between faculty and students, submission of assignments, and secure posting of grades and feedback in your courses. To access Brightspace, go to mycourses.stonybrook.edu and use your SBU NetID and password. If you are unsure of your NetID, visit Finding Your NetID and Password for more information.

Sometimes submitting coursework via a tablet and/or mobile device can be challenging. Computers equipped with the appropriate software are available for use at the various SINC site computer labs. Both physical and virtual labs are available. You can also borrow a computer through SBU's Laptop Loan Program.

Visit the Technical Requirements page for additional information regarding hardware and software options.

Please use the following information if you need technical assistance at any time during the course or to report a problem with Brightspace:
Brightspace Support via SUNY Helpdesk
- Phone: 1-844-673-6786
- Submit a ticket or chat online

Stony Brook University: Academic Technology Services
- Phone: 631-632-9800
- Email: AcademicTechnologies@stonybrook.edu

## UNIVERSITY POLICIES

**Student Accessibility Support Center Statement**
If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

**Academic Integrity Statement**
Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Professions, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html

**Critical Incident Management**
Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn.

**Course Materials and Copyright Statement**
Course material accessed from Brightspace, Zoom, Echo 360, VoiceThread, etc. is for the exclusive use of students who are currently enrolled in the course. **Content from these systems cannot be reused or distributed without written permission of the instructor and/or the copyright holder.** Duplication of materials protected by copyright, without permission of the copyright holder is a violation of the Federal copyright law, as well as a violation of Stony Brook's Academic Integrity.

## (Tentative) Weekly Schedule of Topics and Readings

**Week 1:**
The Economic Approach (Chapter 2)

1. Human-Environment Relationship
2. Environmental Problems and Economic Efficiency
3. Property Rights, Externalities, and Role for the Government

Cost-Benefit Analysis for Environmental Policy (Chapter 3)

1. Valuing Costs and Benefits
2. Discounting Costs and Benefits
3. The Treatment of Risk and Uncertainty
4. Decision Rules

**Week 2:**
Methods for Environmental Valuation (Chapter 4)

1. Revealed preference methods
2. Stated preference methods

Dynamic Efficiency and Sustainable Development (Chapter 5)

1. A Two-Period Model
2. Intertemporal Fairness and Efficient Allocations
3. Implications for Environmental Policy

**Week 3:**

Depletable Resource Allocation (Chapter 6)

1. Longer Horizons
2. Substitutes
3. Extraction Cost

Transition from Depletable to Renewable Resources (Chapter 7)

1. Natural Gas
2. Oil
3. Fossil Fuels
4. Electricity

**MIDTERM EXAM 1:** Covers Material in Weeks 1-3.

**Week 4:**

Recyclable Resources (Chapter 8)

1. Minerals
2. An Efficient Allocation of Recyclable Resources
3. Market Imperfections

Water: A Confluence of Renewable and Depletable Resources (Chapter 9)

1. Water Scarcity
2. Efficient allocation of Water
3. Current Allocation System

**Week 5:**

A Locationally Fixed, Multipurpose resources: Land (Chapter 10)

1. The Economics of Land Allocation
2. Sources of Inefficient Use and Conversion
3. Innovative Market-Based Policies Remedies

Storable, Renewable Resources: Forests (Chapter 11)

1. Characterizing Forest Harvesting Decisions
2. Sources of Inefficiency
3. Sustainable Forestry and Public Policy

**Week 6:**

Economics of Pollution Control (Chapter 14) and Climate Change (Chapter 17)

1. Introduction to Pollution Damage
2. Efficient Allocation of Pollution, Market Allocation of Pollution
3. Introduction to Climate Change

4. International negotiations over Climate Change policy

**MIDTERM EXAM 2:** Covers Material in Weeks 4-6.

**FINAL EXAM:** Covers Material in Weeks 1-6.