

ECON 3535: Natural Resource Economics

Lecture:	MBE 156, MWF, 2:30-3:20 PM
Instructor:	Fengyu Zhang
Office:	ECON 313
Office Hours:	M & W 1:00-2:00 PM and by appointment
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Course Description

This course in natural resource economics explores the interactions between natural resources and the broader economic system. It examines classic allocation problems involving both renewable and non-renewable resources, with particular attention to the role of institutions in shaping patterns of resource use. By analyzing the incentives faced by resource users, the course investigates sources of market failure and evaluates when economic intervention may be warranted. Given the importance of natural resources in contemporary energy and environmental policy debates, the course also covers topics such as climate change, renewable energy, transportation, and sustainability. Overall, the course aims to develop students' ability to analyze incentives and trade-offs through an economic lens.

Textbook

The required textbook is Tom Tietenberg & Lynne Lewis, *Environmental and Natural Resource Economics*, 12th ed., Prentice Hall, 2023. **You are not required to purchase this textbook.** A PDF of the 11th edition is available on Canvas. Students may purchase the 12th edition through CU's Select Digital Access program if desired.

Course Organization

Class periods will be a mix of lecture and discussion. Students are expected to attend class and participate actively. The first half of the class focuses on the theory of natural resource economics, with a midterm covering this material midway through the course. The second half focuses on applications to natural resource, energy, and environmental policy. The final exam covers material from the second half of the course. In addition to lectures and exams, this course will include readings from the textbook and graded unit summaries.

Office Hours

Office hours are held in-person every Monday and Wednesday from 1:00–2:00 PM in ECON 313 (Economics Building, 3rd floor). Additional office hours may be scheduled by appointment.

Grading

Grades in this course will be determined by unit summaries, mathematical problems, the midterm exam, and the final exam.

Course Grading Scheme:

Unit Summaries:	20%
Mathematical Problems:	20%
Midterm Exam:	30%
Final Exam:	30%
Total:	100%

Grading Scale:

A	> 94	C	73–76
A-	90–93	C-	70–72
B+	87–89	D+	67–69
B	83–86	D	63–66
B-	80–82	D-	60–62
C+	77–79	F	< 60

Grades are rounded to the nearest digit. For example, 89.5 rounds to 90 (A-) while 89.4 rounds to 89 (B+).

Break Down of Points

- **Unit Summaries:** At the end of each of the six units, students are required to submit a written summary reviewing the material covered. Each summary should be 2–3 pages, single-spaced, 12-pt. Summaries exceeding three pages will incur a 10% penalty. Each summary should include a discussion of open or unresolved questions or debates related to the unit. Summaries will be graded based on timely submission and demonstrated effort. All work must be your own original work, and submissions must be uploaded to Canvas as PDF files. Each summary contributes equally to the final grade.
- **Mathematical Problems:** Each unit includes a set of mathematical problems similar to those covered in lecture. Work individually or in a group of 2–3 students. For group submissions, only one person needs to submit, but all group members' names must be listed to receive credit. Problems will be graded on correctness. Submissions must be uploaded to Canvas as PDF files. Each problem set contributes equally to your final grade.
- **Midterm Exam:** Covers Units 1–3, including multiple-choice, short-answer, and mathematical problems. The exam is in-class and closed book, during regular class time (2:30–3:20 PM) in the first week of March. The exact date will be announced at least two weeks in advance.
- **Final Exam:** Covers Units 4–6 (not cumulative), including multiple-choice, short-answer, and mathematical problems. The final exam is in-person and closed book. The university-assigned date is TBD. The exam will be held in the usual classroom once scheduled.

Course Topics

1. Extraction of Non-Renewable Resources

- Mineral Products
- Oil and Gas
- Groundwater

2. Extraction of Renewable Resources

- Fisheries
- Forestry
- Agriculture

3. Property Rights and Institutions

- Open-access
- Common Property
- The Resource Curse

Midterm Exam

4. Natural Resource Policy

- Regulating Externalities
- Property Rights Approaches

5. Climate Change

- Costs of Climate Change
- Climate Policies
- Technological Innovation

6. Renewable Energy

- Power Sector
- Transportation Sector

Final Exam

Course Policies

- **Attendance:** Attendance is not taken, but regular participation is strongly recommended. Lecture slides are posted on Canvas for study purposes, but slides are not a substitute for attending class.
- **Late Submissions:** Late submissions incur a penalty of 2% per hour, applied to the total assignment score. For example, if an assignment is worth 100 points and a student earns 90 points, submitting it 5 hours late will incur a 10% penalty, reducing the score to 80/100. Submissions more than 50 hours late will receive a score of 0. Late penalties are applied automatically through Canvas, and submission timestamps recorded by Canvas will be used to determine lateness.
- **Make-up work:** There will be no makeup tests or assignments, even if your reason for missing the deadline is very good. If a test conflicts with a mandatory CU event, arrangements can be made for you to take the test before the scheduled test day, but not afterwards.
- **Email Policy:** Use your official colorado.edu email, include your full name, and use *ECON3535* as the subject line. Review the syllabus before emailing to ensure your question is not answered here. Responses may take up to 24 hours on weekdays. I do not regularly check emails on weekends; those messages will be answered on Monday. Start a new email rather than replying to class-wide emails to avoid “reply-all” issues.
- **Technology and AI Policy:** Use of generative AI tools (e.g., ChatGPT) to generate substantive content for assignments is not permitted. Limited use for proofreading or grammar checking is allowed, provided that all ideas, structure, and analysis are entirely your own. All assignments will be checked for plagiarism and AI-generated content. If your work raises concerns, I will schedule a meeting with you to review it. To prevent any issues, I strongly recommend tracking all edits in your text processor (e.g., Word or Sheets) to maintain a clear record of your work.

The use of other technology in class is permitted. However, if your use of technology becomes disruptive to others, I reserve the right to restrict it.

- **Accommodation for Disabilities, Temporary Medical Conditions, and Medical Isolation:** If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the Disability Services website. Contact Disability Services at 303-492-8671 or DSinfo@colorado.edu for further assistance. If you have a temporary medical condition, see Temporary Medical Conditions on the Disability Services website.
If you have a temporary medical condition or required medical isolation for which you require accommodation, please contact me immediately so proper arrangements can be made.
- **Preferred Names and Pronouns:** CU Boulder recognizes that students’ legal information doesn’t always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors’ class rosters. In the absence of such updates, the name that appears on the class roster is the student’s legal name.
- **Honor Code:** All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the Honor Code may include but are not limited to: plagiarism (including use of paper writing services or technology [such as essay bots]), cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all

course instructors involved, and aiding academic dishonesty. Understanding the course's syllabus is a vital part in adhering to the Honor Code.

All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: StudentConduct@colorado.edu. Students found responsible for violating the Honor Code will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the faculty member. Visit Honor Code for more information on the academic integrity policy.

- **Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation:** CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits protected-class discrimination and harassment, sexual misconduct (harassment, exploitation, and assault), intimate partner abuse (dating or domestic violence), stalking, and related retaliation by or against members of our community on- and off-campus. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who have been subjected to misconduct can contact OIEC at 303-492-2127 or email CUreport@colorado.edu. Information about university policies, reporting options, and support resources including confidential services can be found on the OIEC website.
Please know that faculty and graduate instructors must inform OIEC when they are made aware of incidents related to these policies regardless of when or where something occurred. This is to ensure that individuals impacted receive outreach from OIEC about resolution options and support resources. To learn more about reporting and support for a variety of concerns, visit the Don't Ignore It page.
- **Religious Holidays:** Campus policy requires faculty to provide reasonable accommodations for students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please communicate the need for a religious accommodation in a timely manner via email. See the campus policy regarding religious observances for full details.
- **Mental Health and Wellness:** The University of Colorado Boulder is committed to the well-being of all students. If you are struggling with personal stressors, mental health or substance use concerns that are impacting academic or daily life, please contact Counseling and Psychiatric Services (CAPS) located in C4C or call (303) 492-2277, 24/7. Free and unlimited telehealth is also available through Academic Live Care. The Academic Live Care site also provides information about additional wellness services on campus that are available to students.
- **For all other cases we will defer to CU's standard policies, specifically:** Students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote, or online. Failure to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation, or political philosophy. For more information, see the classroom behavior policy, the Student Code of Conduct, and the Office of Institutional Equity and Compliance.