

University of Colorado Boulder

**Econ 4535 – Natural Resource Economics
Fall 2023**

Professor: Daniel Kaffine
Office: Economics 208C
Phone: (303) 492-6652
Email: daniel.kaffine@colorado.edu

Lectures: Monday, Wednesday, Friday 11:15-12:05 MEUN E431

Office hours: Monday and Wednesday 12:30-2:00 (and as need be – just ask!)

Course Description: This course in natural resource economics will introduce students to the interlinkages between natural resources and the economic system. Classic allocation problems for renewable and nonrenewable resources will be examined. This course will also consider the fundamental role of institutions in shaping natural resource use. Understanding the incentives faced by users of natural resources will allow us to consider market failures and the important question of whether or not market interventions are justified on economic grounds. Because natural resources play a central role in many current energy and environmental policy debates, this course will also address policy issues related to climate change, renewable energy, and the energy transition.

Course Organization: This course will be a mix of lecture and discussion. The first half of the class (Units I-III) will focus on the theory of natural resource economics, with the Midterm covering this material midway through the course. The second half of the class (Units IV-V) will focus on application to natural resource, energy and environmental policy, with the Final (primarily) covering the material for the last half of the semester. Canvas will be used for course materials and communication.

Textbooks: The required textbook is:

Tom Tietenberg and Lynne Lewis, *Environmental and Natural Resource Economics* 11th ed, Prentice Hall, 2018. (9th and 10th edition are also acceptable – alternative pages for each of these editions are provided on the separate Reading List on Canvas).

Additional readings (journal articles, etc) will be posted on Canvas.

Grading:

Class Participation	10%
Unit summaries	20%
Computational paper	10%
Midterm Exam	30%
Final Exam	30%

Class Participation: Students are expected to have read all materials prior to class and should be prepared to discuss and answer questions regarding the readings. Lecture and discussion will comprise a large component of our in-class time, and students are expected to attend class and contribute. In addition, there will be a low-stakes question at the end of each week (due the following Monday in class) that pertains to the chapter readings for that week.

Unit Assignments: At the end of each of the five units, a unit assignment will be due. This assignment should be worked on with another student with a single submission from the group (alternative arrangements can be discussed with me). The unit assignment consists of three components: First, students will produce a Unit Discussion, which is a 3-page discussion of the material covered in the readings and lectures. This is the primary check-up on the readings from the textbook. The document is expected to analyze the unit material covered and discuss open and unresolved questions or debates related to the unit. Second, each unit assignment will also include a calculus-based mathematical problem. Finally, there will also be a computational problem to be solved in Mathematica. I will provide more details when the first unit assignment is assigned.

Computational Paper: The mathematics required to answer many interesting questions related to natural resources are beyond the scope of the prerequisites for this course. Nonetheless, we will take advantage of the mathematical programming language Mathematica to tackle some of them. Simply follow the link here: <https://oit.colorado.edu/software-hardware/software-catalog/mathematica> to get free access to the software. We will cover a number of examples in class, and for the computational paper you will come up with your own question and answer it using Mathematica.

Exams: The exams will be short answer plus numerical problems. I will provide example questions from past exams as study aides prior to the test date. The Midterm Exam will be in class (roughly mid-October) and cover material from Units I-III. The Final Exam is comprehensive, but weighted towards Unit IV-V, and is scheduled for Sunday December 17th 1:30-4:00pm.

Tentative Schedule

The five units for the class are listed below. We will spend the first few lectures covering some overarching introductory ideas before diving into Unit I. I expect to spend approximately 2-3 weeks on each unit, depending on the volume of the material and general class interest in the unit. For each unit, tentative topics are also listed.

Unit I. Extraction of non-renewable resources
Mineral products
Oil and gas
Groundwater

Unit II. Extraction of renewable resources

Fisheries
Forestry
Agriculture

Unit III. Property rights and institutions
Open access
Common property
The Resource Curse and economic growth

Midterm Exam (mid-October)

Unit IV. Natural resource policy
Regulating externalities
Property rights approaches

Unit V. Climate change and the Energy Transition
Costs of climate change
Climate policies
Energy transition and renewables
Power sector

Final Exam (Sunday December 17th 1:30-4:00)

Important Stuff

CLASSROOM BEHAVIOR

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](#).

Requirements for Infectious Diseases

Members of the CU Boulder community and visitors to campus must follow university, department, and building health and safety requirements and all public health orders to reduce the risk of spreading infectious diseases.

The CU Boulder campus is currently mask optional. However, if masks are again required in classrooms, students who fail to adhere to masking requirements will be asked to leave class. Students who do not leave class when asked or who refuse to comply with these requirements will be referred to Student Conduct & Conflict Resolution. Students

who require accommodation because a disability prevents them from fulfilling safety measures related to infectious disease will be asked to follow the steps in the “Accommodation for Disabilities” statement on this syllabus.

For those who feel ill and think you might have COVID-19 or if you have tested positive for COVID-19, please stay home and follow the [further guidance of the Public Health Office](#). For those who have been in close contact with someone who has COVID-19 but do not have any symptoms and have not tested positive for COVID-19, you do not need to stay home. In this class, if you are sick or quarantined, a simple email to me will suffice.

ACCOMMODATION FOR DISABILITIES, TEMPORARY MEDICAL CONDITIONS, AND MEDICAL ISOLATION

[Disability Services](#) determines accommodations based on documented disabilities in the academic environment. If you qualify for accommodations because of a disability, submit your accommodation letter from Disability Services to your faculty member in a timely manner so your needs can be addressed. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance.

If you have a temporary medical condition or required medical isolation for which you require accommodation, a simple email to me will suffice. Also see [Temporary Medical Conditions](#) on the Disability Services website.

Preferred Student 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.

All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: honor@colorado.edu, 303-492-5550. 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 violence (dating or domestic violence), stalking, and related retaliation by or against members of our community on- and off-campus. These behaviors harm individuals and our community. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who believe they 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 can be found on the [OIEC website](#).

Please know that faculty and graduate instructors have a responsibility to 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 an outreach from OIEC about their options for addressing a concern and the support resources available. To learn more about reporting and support resources for a variety of issues, visit [Don't Ignore It](#).

Religious Holidays

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. 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.