ECON/FRE 374 Land and Resource Economics

Our course is held on the UBC Point Grey (Vancouver) campus, which sits on the traditional, ancestral, and unceded territory of the xwməθkwəy̓əm (Musqueam) People.

Instructor
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Teaching Assistants
TBA

Classes
Tuesday & Thursday | 12:30 - 14:00 | BUCH-Floor 1-Room A102

Office hours
Tuesday |17:30 – 19:00 | MacMillan 331

What you will gain from this course?
Are current levels of environmental pollution and resource depletion efficient? Which incentives lead to the current environmental and resource outcomes? What is the efficient level of resource use? Is there a trade-off between efficiency and equity in resource use? Together, we will build an analytical framework from simple economic principles to answer these questions. We will use it to define the efficient use of natural resources and the environment from society's perspective. We will then formulate policies to improve our society's environmental and resource outcomes. If, at the end of this term, you can

1. Describe the underlying causes for resource and environmental degradation,
2. Calculate efficient levels of resource use and environmental pollution, and
3. Propose resource and environmental policies that lead to efficient outcomes,

this course would have achieved its objective.

Structure of this class
This is an in-person class, and I encourage you to attend the classes as much as possible. However, sometimes you may have to miss classes or even a midterm exam due to sickness or other personal reasons. I will, therefore, only count the top 70 % of all midterm exams (i.e., two out of three) and iCklicker exercises. In other words, you can miss up to 70% of the classes without any consequences for your grade if you have excellent results in the remaining exercises and midterm exams. In addition to the classes, there are office hours. These are for informal discussions and questions. They are an essential component of the course, so please attend them as often as possible.

Please participate in exercises and discussions during this class. However, the class may not answer all of your questions about the content. If you have questions about the structure or content of this course, please ask the instructor during or after the lecture. Please do not talk to your neighbor or classmates during the class unless it is part of the exercise. High noise levels can be distracting and disrupt your classmates' learning process.

Prerequisites
The course requires a basic understanding of microeconomics and mathematics, including the

functioning of markets, utility maximization, and geometry.

Learning outcomes
The course has three parts. The first part introduces local and global environmental and resource problems. The second part provides the economic tools to analyze the environmental and resource problems from an economic perspective. We will also develop efficient solutions for resource problems and discuss policy interventions. The third part applies these methods to specific environmental and resource problems. After the course, you should be able to

Part I

- Describe important environmental and resource problems from an economic perspective
- Explain the incentives and institutions that lead to resource overuse and degradation

Part II

- Calculate efficient levels of resource use
- Develop policies for efficient resource use
- Evaluate resource use and resource policies with respect to efficiency and equity

Part III

- Apply the concepts and methods from parts I and II to the leading global resource problems.

In this course, you should not learn definitions and concepts by heart, but I want you to see environmental problems through the lens of economists. Therefore, this class's main learning objective is to enable you to apply the concepts and solutions to new situations. The learning activities and assessments of learning outcomes are organized around this learning objective.

Learning activities
We will use lectures, midterm exams, a final exam, and graded in-class activities to achieve these learning objectives. These learning activities are described below.

Learning materials
Textbooks: The course follows the textbook by Field. Some sections are also related to the textbook by Keohane & Olmstead. Both textbooks are equivalent for parts I and II of this course. Only Field covers part III. Neither of these textbooks is essential for this class.

- Field, B. C. (2016). Natural resource economics: An introduction. Waveland Press. This book covers most topics of this course.

- Keohane, M. N. O., & Olmstead, S. M. (2016). Markets and the Environment. Island Press. This book is available as an ebook at the UBC library website.

Online Course Material: Available at UBC Canvas: https://canvas.ubc.ca
You are required to regularly log in to your course page for ECON/FRE 374 on Canvas. There, you can access this syllabus, the course lecture slides, additional material, announcements, assignments, and your grades.

Assessment of learning outcomes
Your learning outcomes will be evaluated through exams and class participation. The following table shows how these components determine your final grade.

Assessment Tool	Date or Other Information	Percent of Grade
Midterm exams	There are three midterm exams: October 3, October 24, November 19	45 percent
Class participation	iClicker questions throughout the lectures	10 percent
Video assignment	Instructions will be posted on Canvas.	5 percent
Final exam	As per the university exam schedule.	40 percent

Exams

The midterm exam and the final exams will include only short answer questions. About 70% of the questions require simple calculations, while about 30% will be essay questions.

Midterm exams: There are three midterms. They will cover the material between the previous midterm exam (or the start of the course) and the current exam. Only your two best exams will count towards your final grade. You can, therefore, miss one midterm exam without consequences for your final grade.

Class participation: This course uses *iClicker Cloud*. There will be iClicker questions throughout the lectures. Only correct answers count. However, I will only use the top 70% of your participation days based on your iClicker scores. For example, if you miss two out of ten lectures, I will only use the top seven lectures out of the remaining eight lectures to determine your participation grade.

Video assignment: You will create a short video in a small group about a topic that will be assigned to you. The deadline for video submission is before the second midterm exam. The best videos will be shown in class.

Final exam: The final examination will cover All content covered during the course. However, there will be more questions on the content we covered after the third midterm exam. Student Services will schedule the final exams for any time during the examination period. *You have to ensure that you are available throughout that period.*

Questions?

Please ask your questions in class or come to my office hours. Your questions will help others to understand the topic, and they will create a positive and interactive atmosphere in class. *This is a big class, and I cannot answer questions about the content individually by email.* If you have administrative questions, please include ECON 374 or FRE 374 in the subject header to make it easier for me to find your email. I typically answer emails within three workdays. Please have a look at the syllabus before you ask your question.

Course Outline

The content of this class may change slightly during the course. You can make suggestions during the first weeks of the course if you are especially interested in a topic not covered by the class, and I will try to accommodate your suggestions.

1. *Introduction*

   This chapter introduces examples of environmental and resource problems to illustrate the

problems we will address in this course. We will discuss how individual incentives lead to climate change, the costs and benefits of biodiversity conservation, and how fisheries regulation addresses the problem of overfishing.

2. *Benefits of resource use and conservation*
   In this chapter, you will learn how to i) derive demand functions from marginal willingness to pay of individuals, ii) aggregate individual demand functions to market demand, and iii) evaluate the value of resources when markets are missing.

3. *Costs*
   This chapter introduces i) the concepts of opportunity and social costs, ii) the relation of production costs and market supply, and iii) the value of time.

4. *Efficiency, markets and distributions*
   This chapter discusses i) the notion of efficiency, i) why free markets can lead to efficient outcomes, ii) what externalities are, iii) why they render market outcomes inefficient, iv) efficiency and distributions, and v) dynamic efficiency (efficiency over time).

Midterm exam I

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5. *Sustainability*
   We discuss trade-offs between the well-being of current and future generations and between environmental conservation and economic wealth.

6. *Benefit-Cost Analysis*
   This chapter introduces benefit-cost analysis as a tool to guide economic decisions.

7. *Policies*
   This chapter introduces taxes, quotas, and property rights as policies to achieve environmental health and economic efficiency. It also discusses institutions.

Midterm exam II

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8. *Non-renewable resources & climate change*
   We will discuss the optimal extraction of non-renewable resources, including minerals and fossil fuels, over time. We then discuss the impact of fossil fuel consumption on climate change.

9. *Water Resources*
   In this chapter, we will discuss the optimal use of water. We will treat water as a renewable resource without the complicated dynamics of living resources such as fish stocks. We discuss current problems of groundwater depletion.

10. *Fisheries economics*
    This chapter focuses on fisheries. We will discuss the causes of overfishing and possible

solutions.

Midterm exam III

11. *Forest economics*
    In this chapter, we discuss optimal forest management and the optimal timing of the harvest. We also discuss deforestation, forest conservation and payment for ecosystem services.

12. *Biodiversity conservation*
    Here, we will talk about i) the idea of biodiversity and its value for the economy, ii) extinction from an economic perspective, iii) conservation strategies including protected areas, iv) the cost of wildlife and the control of pests.

13. *Land economics*
    This section discusses i) spatial pattern of land use, ii) negative externalities from land use, and iii) land use regulation.

Statement on Academic Honesty
It is the policy of the Faculty of Land and Food Systems (LFS) and the Vancouver School of Economics (VSE) to report all violations of UBC's standards for academic integrity. You are personally responsible for knowing the behaviours that are considered a violation of UBC's policies for academic honesty found here: https://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,0. Any student who violates the rules for academic conduct on submitted work will be given an automatic grade of zero on that component of the course. Further penalties may be levied by the President's Advisory Committee on Student Discipline. Those penalties might include a notation on your transcript indicating that you have committed an academic offence, failure of the course, and/or suspension from the university. You can see more on this process, including a complete list of annual academic discipline cases, here: https://universitycounsel.ubc.ca/homepage/guides-and-resources/discipline/. Speak to your instructor if you have any questions regarding the standard for academic integrity at UBC.

Academic Concessions
Students at UBC are granted academic concessions for graded work and exams that are missed due to unexpected circumstances. There are only three grounds for academic concessions: unexpected changes in personal responsibilities; medical circumstances; and compassionate grounds. A detailed description of each can be found here: https://students.ubc.ca/enrolment/academic-learning-resources/academic-concessions. Situations that are expected (such as time constraints due to workload in other courses) or are predictable (such as being scheduled for paid work) are not grounds for academic concession. It is expected that requests for academic concession will be made before the due date for that graded work and/or the writing of the exam. Note that UBC policy does not allow for concessions to students who have missed work because they have registered for a course after the due date for that work. Students in the Faculty of Arts who require a concession should apply for a concession using this form: https://students.air.arts.ubc.ca/academic-concession-form/. Students in other Faculties should consult their Faculty website on academic concessions and consult with their instructor.

Student Success
UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious, spiritual and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available here: https://senate.ubc.ca/policies-resources-support-student-success/.

Policy on Sharing Course Materials
You will note that all the materials provided to you in this course, including this document, include the statement "©Frederik Noack ALL RIGHTS RESERVED". Sharing course materials in any way, either by email or by uploading them to websites, will be treated as an infringement of your instructor's intellectual property and dealt with accordingly.

Mental Health
As a student, you may experience a range of challenges that can interfere with learning, such as strained relationships, increased anxiety, substance use, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may diminish your academic performance and/or reduce your ability to participate in daily activities. I encourage you to take advantage of the many resources available at UBC to help you cope with challenges. You can find access to those resources here: https://keeplearning.ubc.ca/self-care/. Students looking for help with disability-related accommodations and support should speak to an advisor at the Center for Accessibility: https://students.ubc.ca/about-student-services/centre-for-accessibility.