

ECON/FRE 374 Land and Resource Economics

Our course is held on the UBC Point Grey (Vancouver) campus, which sits on the traditional, ancestral, unceded territory of the x^wməθk^wəyəm (Musqueam) First Nation.

Instructor

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Teaching Assistants

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Classes

Tuesday & Thursday | 12:30 - 14:00 | West Mall Swing Space 221

Office hours:

Friday | 12:00 – 13:00 | MacMillan 331 (Frederik Noack)

Tuesday | 2:30 to 3:30 | IONA 434 (Gabriel Brown)

What you will gain from this course?

Together, we will build an analytical framework from simple economic principles. We will use it to define the efficient use of natural resources and the environment from society's perspective. We will use this framework to answer questions like: 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? We will then formulate policies to improve the environmental and resource outcomes for our society. If, at the end of this term, you can

1. Identify environmental problems from an economic perspective,
2. Describe the underlying causes for resource end environmental degradation,
3. Calculate efficient levels of resource use, and
4. Propose resource policies that lead to efficient outcomes

this course would have achieved its objective.

Structure of this class

This is an in-person class. Pre-recorded lecture videos and slides will be available on the Canvas page of this course. They cover the same material as the lectures and will help you to recap the classes or to make up missed classes.

The office hours are for informal discussions and questions. They are an important component of the course - so please attend them as often as possible. There will be no extra office hours before the exam.

Please participate in exercises and discussions during this class. 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 the learning process of your classmates.

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 market-based 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 part II to the main 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. The learning activities and assessments of learning outcomes are organized around these learning objectives.

Learning activities

To achieve these learning objectives, we will use lectures, assignments, a midterm exam, a final exam, and graded in-class activities. 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. Please read the relevant chapter before you come to 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 login to your course page for ECON/FRE 374 on Canvas. There, you can access this syllabus, the prerecorded lectures, the course-lecture slides, additional material, announcements, assignments, and your grades.

Assessment of learning outcomes

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

Assessment Tool	Date or Other Information	Percent of Grade
Midterm exam	October 20	30 percent
Assignments	Five assignments will be posted on Canvas throughout the term.	20 percent
Class participation	iClicker, discussions and exercises	10 percent
Final exam	As per university exam schedule.	40 percent

Exams

The midterm exam and the final exams will include only short answer questions. Some questions require simple calculations while other questions will be essay questions. The final examination will cover *ALL content covered during the term*.

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.*

Assignments

Five assignments will be posted on Canvas. They cover the topics of the class and are meant as exercises for the midterm and the final exam. Each student should answer them independently. Assignments must be turned in electronically via Canvas by the due date. Late assignments will be graded with zero. *Only your four best assignments will determine your grade.* Therefore, if you miss one assignment, only the four other assignments will determine your grade. Please hand in as many assignments as possible, in case you miss one assignment for e.g. medical reasons.

Class participation

iClicker: This course uses *iClicker Cloud*. There will be iClicker questions throughout the lectures. For each correct answer, you will get the full points, for an incorrect answer you will get half of the points. 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. Your iClicker scores will contribute 5% towards your overall grade.

Discussions and exercises: There will be graded group discussions and exercises during the class. They count an additional 5% towards your final grade.

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 will not be able to 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 relevant textbook chapters are listed below each section of the class. Please read the relevant chapter before you come to class.

Part I: Introduction

1. Introduction

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

Part II: Concepts and Methods

2. Market failures and the environment

In this chapter, we will discuss i) why free markets can lead to efficient outcomes, ii) what externalities are and iii) why they render market outcomes inefficient.

Field, Chapter 6

Keohane & Olmstead, Chapter 4 & 5

3. 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.

Field, Chapter 3 & 9

Keohane & Olmstead, Chapter 3: Evaluating the Benefits

4. 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.

Field, Chapter 4 & 9

Keohane & Olmstead, Chapter 3

5. Efficiency and distributions

This chapter discusses i) the notion of efficiency, ii) efficiency and distributions and iii) dynamic efficiency (efficiency over time)

Field, Chapter 5

Keohane & Olmstead, Chapter 2

6. Sustainability

We discuss trade-offs between the wellbeing of current and future generations as well as between environmental conservation and economic wealth.

Field, Chapter 5: Efficiency and intergenerational equity

Keohane & Olmstead, Chapter 11

7. Principles of analysis

This chapter introduces cost-benefit analysis as a tool to guide economic decisions.

Field, Chapter 8

Keohane & Olmstead, Chapter 3: Benefit-Cost Analysis

8. Resource and environmental policies

This chapter introduces taxes, quota and property rights as policies to achieve

environmental health and economic efficiency.

Field, Chapter 7

Keohane & Olmstead, Chapter 8, 9 & 10

Midterm exam

Part III: Applied Natural Resource Problems

9. *Mineral Economics & climate change*

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

Field, Chapter 10

10. *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.

Field, Chapter 15

11. *Marine Resources*

This chapter focuses on fisheries. We will discuss causes of overfishing and possible solutions.

Field, Chapter 13

12. *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.

Field, Chapter 12

13. *Biodiversity conservation*

Here, we will talk about the i) idea of biodiversity and its value for the economy, ii) conservation strategies including protected areas, iii) the cost of wildlife and the control of pests.

Field, Chapter 18 & 19

14. *Land*

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

Field, Chapter 14 & 16

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.

VSE Policy Prohibiting the Hiring of Tutors:

The Vancouver School of Economics expressly prohibits any student from hiring a tutor/editor to assist with any portion of written work or academic research. Violation of this rule will be treated as academic misconduct, and the student will face the same penalties as described above. If at any point you feel in need of additional writing support, please speak with your instructor and/or arrange for a writing consultation with UBC's Centre for Writing and Scholarly Communication (<https://writing.library.ubc.ca/>).

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>.