

# ECON/FRE 374: Land and Resource Economics

## Classes and office hours

Class Meets: Mondays 11:00 to 12:00

Office hours:

Monday 6:00 pm to 7:00 pm

Wednesday 11:00 am to 12:00 pm

## Instructor and TAs

Instructor

Frederik Noack

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Teaching Assistants

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## Questions?

Please ask these questions in class, come to my office hours, or use the **online discussion** board of the Canvas page. Your questions will help others to understand the topic as well and will create a positive and interactive atmosphere in class.

*In class (Zoom):* Please use the chat function in Zoom. My TAs and I will try to answer the questions as soon as possible.

*Email:* 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. However, many questions are already answered in the syllabus.

*Canvas:* Please use the discussion board on Canvas to ask your questions about the content of this class. My TAs and I will moderate the online discussion to make sure that all questions will be answered.

## Structure of this class

This is an online class. Pre-recorded videos and the lecture slides will be available on the Canvas page of this course.

Please watch these videos regularly. In addition to these videos, we will have a synchronous class on Mondays from 11:00 to 12:00 in which we will do exercises and discuss the topics covered in the prerecorded lectures.

The office hours are meant 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.

## Prerequisites

An introductory level course in microeconomic theory.

### **Why you should take this course?**

Do you wonder why our fish are severely over-exploited? Record numbers of known wildlife species are going extinct? If we leave enough resource for future generations? How we should divide land between improving food security and protecting the natural environment? Or do you care about other similar questions? If you do, this course is for you.

What you will gain from this course?

Together, we will build an analytical framework from simple economic principles. We will use it to define society's optimal preservation of natural resources, and evaluate over-exploitation. We will then ask: why do we make sub-optimal decisions? There will be no single answer, but we will be able to identify significant issues. Is the market failing to do the optimal? When it comes to natural resources, the market often fails. What can we do to improve it? Based on the type of resource, we will study how policy can bring exploitation to optimal levels.

We will not find any definite solutions to the above questions. We will instead learn of some of the major economic explanations and discuss policies for sustainable development. If, at the end of this term, you can identify the economic reasons underlying natural resource decisions in the real world and suggest policies to improve environmental outcomes for the society, this course would have achieved its objective.

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### **Textbooks**

This course does not follow a specific textbook. The following textbooks are a good source of information and cover parts of this lecture but they are not mandatory.

- Field, B. C. (2016). Natural resource economics: An introduction. Waveland Press.
- Karp, L. (2017). [Natural Resources as Capital](#). MIT Press.  
A manuscript of the book is freely available on Larry Karp's webpage.
- 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.

### **Evaluation**

After this course you should be able to

- understand the economic reasons for environmental degradation

- define efficient resource use from a society's perspective and
- suggest policy tools to incentivize optimal environmental outcomes.

I don't want you to learn definitions and concepts by heart but I want you to see environmental problems through the lens of economists. The course evaluations are organized around these learning objectives.

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 19	20 percent
Assignments	Five assignments will be posted on Canvas during the term	20 percent
Quizzes and class participation	Online quizzes and discussions in the synchronous part of this class (20 percent). Answering questions in the online discussion on the Canvas discussion page (3 percent).	20 + percent
Final exam	As per university exam schedule.	40 percent

### Exams:

All midterm and final exams will include only short answer questions. The final examination will cover *ALL content covered during the term*.

The Registrar's Office will schedule the end of term 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 enter your grade.*

### Quizzes and Class participation

Class participation is based on online quizzes and in-class discussion. The quizzes contain short answer questions and will be posted on Canvas. These quizzes can be answered before class or during the synchronous part of the class in groups. For the discussions, only participation will be graded. Please make sure you actively participate for the whole time of the lecture. There are three quizzes and three discussions. *Only the top four out of the six contributions to class participation (3 quizzes + 3 discussions) will be used to determine your grade.*

You can get 3 extra points for good answers to questions on the Canvas discussion page. This is not necessary to get the full participation grade. You get one point for an insightful contribution to a discussion or a thorough answer to a topic related question. You get no points for answers to fake questions.

### Prior to Class

In order to be able to answer the quizzes and assignments and to participate in the synchronous part of the class you need to listen and understand the recorded lectures. The course outline below

lists the weeks in which we cover a specific topic. Please watch the lectures prior to coming to class and before answering the assignments and quizzes.

## **Course Outline**

The outline of the course is preliminary and may change during the semester. I list the week behind each chapter in which I will cover the content. This is mean as a guide for you to prepare for the synchronous lecture, the quizzes and the assignments. There are about 12 weeks in this term.

### **Part I: Introduction**

1. *Introduction (week 1)*

In this chapter, you will learn about the state of the global climate, fisheries and biodiversity. We will discuss the economic drivers as well as the impact of environmental policies.

### **Part II: Concepts and Methods**

2. *Market failures and the environment (week 1)*

In this chapter, I will introduce environmental externalities and missing prices.

3. *Benefits of resource use and conservation (week 2)*

This chapter introduces different benefits from resource use as well as valuation methods to assess missing prices.

4. *Costs (week 2)*

This chapter introduces the concept of opportunity costs and discusses costs of resource use and conservation.

5. *Efficiency and distributions (week 3)*

I will introduce different concepts of efficiency. We then discuss potential tradeoffs between efficiency and equity and learn how to use concepts of Pareto and Kaldor–Hicks efficiency to evaluate outcomes.

6. *Time and sustainability (week 4)*

This chapter introduces time in the concept of efficiency. You will learn how to compare benefits and costs that accrue at different points in time. We discuss tradeoffs between the wellbeing of current and future generations.

7. *Principles of analysis (week 5)*

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

8. *Resource and environmental policies (week 6)*

I will introduce taxes, quota and property rights as policies to achieve environmental health and economic efficiency.

### **Part III: Applied Natural Resource Problems**

9. *Mineral Economics (week 7)*

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.

10. *Water Resources (week 8)*

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.

11. *Marine Resources (week 9)*

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

12. *Forest Economics (week 10)*

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

13. *Biodiversity conservation (week 11)*

Here we will talk about the idea of biodiversity and its value for the economy. We also discuss conservation strategies including protected areas.

14. *Land and food (week 12)*

We will discuss the options of feeding an increasing number of people while conserving the environment from an economic perspective.