

# ENVIROMENTAL ECONOMICS

**Bachelor in Economics BIE SEP-2024 EE-Ec.3.M.A**

Area Economics

Number of sessions: 15

Academic year: 24-25

Degree course: THIRD

Number of credits: 3.0

Semester: 1<sup>o</sup>

Category: COMPULSORY

Language: English

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## SUBJECT DESCRIPTION

In this course, we will delve into the fundamental concepts of environmental economics and climate change economics. Our exploration will encompass critical subjects such as CO<sub>2</sub> emissions control policies and strategies for mitigating and adapting to climate change. Environmental and climate change economics, though relatively young, have become well-established branches of economics, attracting a growing number of students. By effectively applying standard microeconomic analysis (environmental economics) and macroeconomic analysis (climate change economics), economists have successfully challenged common misconceptions held by policymakers and environmentalists alike.

Throughout the duration of the course, we will examine key concepts and recent advancements in environmental economics to address pressing environmental policy questions. Our primary focus will revolve around understanding the dynamic interplay between human activities and the natural environment.

The initial segment of the course will concentrate on environmental topics, exploring the connections between public goods, externalities, pollution, and CO2 emissions control policies. We will delve into adaptation strategies, taxation, tradable permits, innovation and diffusion, as well as the political economy surrounding these issues.

The second part of the course will be dedicated to the economics of climate change. Here, we will examine the interlinkages between macroeconomics and the energy transition, carbon mitigation policies, and the significance of adaptation and green innovation in tackling climate challenges.

The material for the course will be available on Blackboard.

## LEARNING OBJECTIVES

By the end of this course, students will have developed a comprehensive understanding of the main topics covered in environmental and climate change economics. They will also acquire proficiency in utilizing various analytical frameworks employed by economists to explore questions related to the environmental and climate change economics.

## TEACHING METHODOLOGY

IE University teaching method is defined by its collaborative, active, and applied nature. Students actively participate in the whole process to build their knowledge and sharpen their skills. Professor's main role is to lead and guide students to achieve the learning objectives of the course. This is done by engaging in a diverse range of teaching techniques and different types of learning activities such as the following:

Learning Activity	Weighting	Estimated time a student should dedicate to prepare for and participate in
Lectures	33.33 %	25.0 hours
Discussions	13.33 %	10.0 hours
Exercises in class, Asynchronous sessions, Field Work	13.33 %	10.0 hours
Group work	20.0 %	15.0 hours
Individual studying	20.0 %	15.0 hours
TOTAL	100.0 %	75.0 hours

## HOW TO APPROACH YOUR STUDIES

How will I run the classes and how should you approach the study of this course?

You will have lectures, readings, and problem sets every week, and you will be expected to produce a group project (including a presentation) and sit an exam. It is of utmost importance that you diligently read the assigned material every week. Even more importantly, it is highly recommended that you read the material at the suggested time, as this will greatly enhance your comprehension during lectures. Additionally, it will significantly contribute to your productivity when working on problem sets and the group project. Each problem set will require you to apply the concepts and tools covered in the lectures and assigned readings.

By following these guidelines, you will optimize your learning experience in this course, ensuring that lectures and classes are more accessible, and that problem sets, and the group project contributes meaningfully to your overall understanding. Below we outline a methodology to be successful on this course.

## **PROGRAM**

### **SESSIONS 1 - 2 (LIVE IN-PERSON)**

#### **Sessions 1 and 2: Environmental Externalities**

- The environment/economy linkages
- The first theorem of welfare and the theory of market failure
- The efficient level of environmental emissions
  - Readings:
    - Lecture notes 1 and 2
    - Schlenker, W. and Walker, W. R. "Airports, air pollution, and contemporaneous health", *The Review of Economic Studies*, (2016)
    - Muehlenbachs, L. et al. "The Housing Market Impacts of Shale Gas Development." *The American Economic Review*, (2015)
    - Deschênes, O. et al. "Defensive Investments and the Demand for Air Quality: Evidence from the NOx Budget Program", *The American Economic Review*, (2017)

### **SESSIONS 3 - 4 (LIVE IN-PERSON)**

#### **Sessions 3 and 4: Economics of CO2 Emissions Control - I**

- Non-interventionist instruments for pollution control: Coase theorem and moral suasion
- Market-based instruments: i) Taxes/Subsidies, ii) Tradable Permits, and iii) command and control
  - Readings:
    - Lecture notes 3 and 4
    - Ito, K "Moral Suasion and Economic Incentives: Field Experimental Evidence from Energy Demand", *American Economic Journal: Economic Policy*, (2018)
    - Heutel, G. "How should environmental policy respond to business cycles? Optimal policy under persistent productivity shocks", *Review of Economic Dynamics*, (2012)

### **SESSIONS 5 - 6 (LIVE IN-PERSON)**

#### **Sessions 5 and 6: Economics of CO2 Emissions Control - II**

- The optimal choice between price and quantity controls under uncertainty
- Role of abatement technologies and green R&D
  - Readings:
    - Lecture notes 3 and 4
    - Weitzman, M. "Prices vs. Quantities", *The Review of Economic Studies*, (1974)
    - Fowle, M. et al. "Do Energy Efficiency Investments Deliver? Evidence from the

Weatherization Assistance Program”, The Quarterly Journal of Economics, (2018)

## **SESSIONS 7 - 8 (LIVE IN-PERSON)**

### **Sessions 7 and 8: Climate Physical Science and Climate Damages**

- An overview of climate science
- Climate damages and output/output growth: an empirical and theoretical perspective
  - Readings:
    - Lecture notes 7 and 8
    - Read Baede et al. 2001. The Climate System: an Overview. This is chapter 1 in “Climate Change 2001”, the physical science assessment of the IPCC third assessment report. (<https://www.ipcc.ch/site/assets/uploads/2018/03/TAR-01.pdf>)
    - Nordhaus, W. “To Slow or Not to Slow: The Economics of The Greenhouse Effect”, The Economic Journal (1991)
    - Stern, N. “The Economics of Climate Change”, The American Economic Review, (2008)
    - Valuing Climate Damages, Updating Estimation of the Social Cost of Carbon Dioxide, (2017)
    - <https://nap.nationalacademies.org/catalog/24651/valuing-climate-damages-updating-estimation-of-the-social-cost-of>

## **SESSIONS 9 - 10 (LIVE IN-PERSON)**

### **Sessions 9 and 10: Mitigation and Adaptation Policies – I**

- Macro aggregates and climate mitigation policies
- Introducing the social cost of carbon
  - Readings:
    - Lecture notes 9 and 10
    - Golosov, M et al. “Optimal taxes on fossil fuel in general equilibrium”, Econometrica, (2014).

## **SESSIONS 11 - 12 (LIVE IN-PERSON)**

### **Sessions 11 and 12: Mitigation and Adaptation Policies – II**

- The role of green innovation and subsidies
- Inequality and distributional aspects of climate damages and net-zero policies
  - Readings:
    - Lecture notes 11 and 12
    - Acemoglu, D. et al. “The Environment and Directed Technical Change”, The American Economic Review, (2012)

## **SESSIONS 13 - 14 (LIVE IN-PERSON)**

### **Sessions 13 and 14: Presentations**

## **SESSION 15 (LIVE IN-PERSON)**

## Exam

## EVALUATION CRITERIA

### ABOUT THE GROUP PROJECT AND PRESENTATION (60%)

You and your teammates will collaborate on a project. Your primary objective will be to offer an interpretation and replication/extension of the assigned reading, applying the knowledge and concepts acquired throughout the course.

Detailed instructions regarding the project, the assigned reading, and the formation of groups will be provided on Blackboard. The deadline for the project submission will be communicated at that time.

criteria	percentage	Learning Objectives	Comments
Final Exam	40 %		
Group Work	30 %		
Group Presentation	30 %		

### RE-SIT / RE-TAKE POLICY

#### READINGS

Weekly lectures will focus on academic papers alongside an assignment to guide your reading. These are designed to help deepen your analytical capacity. Students are expected to engage with weekly assignments and actively participate in class discussions.

There is no single textbook for this course. The lecture notes/slides for the course are self-contained! The following first two books can be useful to study the first part of the course (i.e., environmental economics), while the third book could be useful for the second part of the course (i.e., climate change economics):

- Charles Kolstad, Environmental Economics (2nd or 3rd Edition), Oxford University Press
- Barry C. Field and Martha K. Field, Environmental Economics: An Introduction (7th edition)
- Richard S. J. Tol, Climate Economics: Economic Analysis of Climate, Climate Change and Climate Policy (Third Edition)

Students will be required to engage with academic papers at the frontier of the literature such as:

#### Part I: Environmental Economics

- Heutel, G "How should environmental policy respond to business cycles? Optimal policy under persistent productivity shocks", Review of Economic Dynamics, (2012)
- Schlenker, W. and Walker, W. R. "Airports, air pollution, and contemporaneous health." The Review of Economic Studies, (2016)
- Muehlenbachs, L. et al. "The Housing Market Impacts of Shale Gas Development." The American Economic Review, (2015)
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- Weitzman, M. "Prices vs. Quantities" The Review of Economic Studies, (1974)
- Fowlie, M. et al. "Do Energy Efficiency Investments Deliver? Evidence from the Weatherization Assistance Program." The Quarterly Journal of Economics, (2018)

## Part II: Climate Change Economics

- Nordhaus, W. "To Slow or Not to Slow: The Economics of The Greenhouse Effect", The Economic Journal (1991)
- Stern, N. "The Economics of Climate Change", The American Economic Review, (2008)
- Acemoglu, D. et al. "The Environment and Directed Technical Change", The American Economic Review, (2012)
- Golosov, M et al. "Optimal taxes on fossil fuel in general equilibrium", Econometrica, (2014)
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## **BEHAVIOR RULES**

Please, check the University's Code of Conduct [here](#). The Program Director may provide further indications.

## **ATTENDANCE POLICY**

Please, check the University's Attendance Policy [here](#). The Program Director may provide further indications.

## **ETHICAL POLICY**

Please, check the University's Ethics Code [here](#). The Program Director may provide further indications.

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