

**Environmental Economics and Natural Resources**

Code: 102840  
ECTS Credits: 9

Degree	Type	Year	Semester
2501915 Environmental Sciences	OB	2	2

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

### Contact

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### Use of Languages

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: No  
Some groups entirely in Spanish: No

### External teachers

José Luis Martínez-González

### Prerequisites

It is recommended to have studied the subject Human Uses of the Earth System of the 1st year.

### Objectives and Contextualisation

Contextualization

The subject

Environmental and Natural Resources Economy (EARN) belongs to the subject "Economics for the environment"

taught by the Faculty of Sciences. This subject concentrates all the subjects of economics, that are distributed by

EARN contributes essentially to the process of learning and learning of the 2nd Course because it introduces cor

understand the relationship between human and natural systems. In particular, we explore the biophysical analysis of the economic process, in what use humans use

the different resources and services that the Earth system offers us.

In addition, it participates in the professional training of the students given that it fosters learning in a series of general competences (among them, the ability to reason

critically and improve self-employment strategies), transversal (for example, to know how to select and generate the information necessary to understand the econo

dynamics of the present and its relation with the environment and the use of natural resources) and specific (to distinguish the biophysical aspects of human activity and

to identify and analyze the impacts environmental aspects of economic activity) that will be very useful for future |

management of the environment and natural resources.

### Training objectives

The objective of the subject is double, on the one hand, to understand the basic concepts of the economy that sh

open to the entry of energy and materials, and to the waste exit. That is, we study the biophysical functioning of e

and the role that naturalresources play in maintaining the economic system.

At the end of the course the student will have a clearer idea of:

- i) The basic concepts of the economy and its use in environmental sciences;
- ii) The basic literature of the methods and concepts presented;
- iii) The relationship between the economic process of human systems and the land system, as well as the differe

### Competences

- Adequately convey information verbally, written and graphic, including the use of new communication and information technologies.
- Analyze and use information critically.

- Collect, analyze and represent data and observations, both qualitative and quantitative, using secure adequate classroom, field and laboratory techniques
- Demonstrate adequate knowledge and use the tools and concepts of the most relevant social science environment.
- Demonstrate concern for quality and praxis.
- Demonstrate initiative and adapt to new situations and problems.
- Teaming developing personal values regarding social skills and teamwork.
- Work autonomously

## Learning Outcomes

1. Adequately convey information verbally, written and graphic, including the use of new communication and information technologies.
2. Analyze and use information critically.
3. Apply the methods of evaluation.
4. Apply the methods of integrated assessment of alternatives presented in the course.
5. Critically analyze basic environmental science literature in Catalan, Castilian and English.
6. Demonstrate concern for quality and praxis.
7. Demonstrate initiative and adapt to new situations and problems.
8. Describe and analyze the process of change in the natural environment.
9. Distinguish the biophysical aspects (resource use and waste generation) related to the process of economic activity.
10. Identify environmental and social impacts associated with human activity.
11. Observe, recognize, analyze, measure and adequately represent economic processes applied to environmental sciences.
12. Properly use the analytical concepts of environmental science.
13. Recognizing the effects of human activity on the environment.
14. Teaming developing personal values regarding social skills and teamwork.
15. Work autonomously

## Content

### FIRST PART

1. The economic system and the environment. Economy and ecological economy: conceptual and methodologic

#### Basic Reading:

- Common and Stagl - *Introduction to the ecological economy. The economy in the environment: A conceptual framework.*
- Krugman, Wells and Olney - *What is economics? Habitual actions of daily life. Basic principles.*
- Blanco - *The Economy: Concepts and fundamental problems.*
- Samuelson - *The fundamentals of the economy.*

2. Markets and prices: supply and demand.

Basic Reading:

- Common and Stiglitz - *Exchange and markets.*
- Krugman, Wells and Olney - *Offer and demand. The market strikes back.*
- Samuelson - *Basic elements of supply and demand. Applications of supply and demand.*
- White - *The Demand, the Offer and the Market.*

3. Production and costs.

Basic Reading:

- Krugman, Wells and Olney - *The producer. What is behind the supply curve: productive factors and costs. Perfect competition and the supply curve.*
- Samuelson - *Production and organization of business. Cost analysis. Production, cost theory and business decisions.*

4. Market structures: competitive markets and non-competitive markets.

Basic Reading:

- Krugman, Wells and Olney - *Markets and efficiency. Market structure: beyond perfect competition. Monopoly. Oligopoly Monopolistic competition and product differentiation.*
- Samuelson - *Analysis of perfectly competitive markets. Imperfect competition and monopoly. The oligopoly and monopolistic competition.*

5. Fundamentals of public sector intervention.

Basic Reading:

- Common and Stiglitz - *Limits to the markets.*
- Samuelson - *Protection of the environment.*

6. Macroeconomics: the economic system from an aggregate perspective.

Basic Reading:

- Common and Stiglitz - *Economic growth and environment*.
- Krugman, Wells and Olney - *Introduction to macroeconomics. Macroeconomics: a global vision. Short-term economic fluctuations. The aggregate supply and demand. Fiscal policy The taxes and the multiplier. Money, Central Banks and monetary policy.*
- Samuelson - *General overview of macroeconomics. Economic cycles and aggregate demand theory. Guarantee price stability. The central bank and monetary policy. The process of economic growth. The exchange rates and the international financial system. Macroeconomic policies to promote growth and stability.*

7. Macroeconomic accounting and environmental accounts.

Basic Reading:

- Common and Stiglitz - *Economic accounting*.
- Krugman, Wells and Olney - *Evaluate macroeconomics*.

## SECOND PART

1. Instruments of environmental economic policy

- a. Externalities
- b. Optimal level of contamination
- c. Internalization of externalities
- d. Pigou and green taxation
- e. Coase and the emission rights market
- f. Payment for environmental services

Basic Reading: Martínez Alier and Roca Págs. 131-230.

Complementary Reading: Martínez and Kosoy 2007; Puig and Freire 2007; Romero 1997: 29-50.

2. Monetary valuation and the environment

- a. Ecological value and economic value
- b. Families of economic valuation methods
- c. Total economic value
- d. Discount rate

Basic Reading: Martínez Alier and Roca Págs. 231-328.

Additional Reading: Agüero et al. 2005; Romero 1997: 51-76.

### 3. Cost-benefit analysis

- a. Economic and political democracy
- b. Arrow's impossibility theorem
- c. Kaldor-Hicks compensation criterion
- d. Relationship between efficiency and equity
- e. Risk, uncertainty and irreversibility

Basic Reading: Martínez Alier and Roca Págs. 231-328.

Additional Reading: Munda 1996.

### 4. Multi-criteria evaluation

- a. Methodological foundations (substantive and procedural rationality, complexity and post-normal science).
- b. Structuring of a multi-criteria problem (alternatives and criteria, weighting of the criteria).
- c. Main discrete multi-criteria approaches (Utility approach, MAUT; Improvement methods; NAIADÉ).
- d. Examples

Basic Reading: Munda 2004.

Additional Reading: Falconí and Burbano 2004.

### 5. Ownership and access to natural resources

- a. Typology of property rights and their relationship with the management of natural resources
- b. Governance of the Commons: Theory and Examples. Hardin's Tragedy of the Commons
- c. Processes of access and exclusion to natural resources
- d. Examples: global commons (sea and atmosphere), biopiracy, land-grabbing

Basic reading: Martínez Alier and Roca Págs. 431-434.

Additional Reading: Aguilera 1992; GRAIN 2014.

### 6. Analysis of non-renewable resources

- a. Resource base and reserves
- b. The Hubbert curve
- c. Hotelling's rule: optimal resource extraction path
- d. Backstop technologies
- e. The rule of El Serafy
- f. EROI or energy rate of return on energy investment
- g. Nuclear energy, waste, time and discount

Basic Reading: Martínez Alier and Roca Págs. 110-118, 382-417.

Additional Reading: Romero 1997: 77-102; Espinoza et al., 2019.

### 7. Analysis of renewable resources

- a. Sustainable performance. Biological vs economic models
- b. Forest economics: technical forestry shift; Faustmann's rule; forest environmental services
- c. Fisheries economics: biological model and economic model

Basic Reading: Martínez Alier and Roca Págs. 418-458.

Additional Reading: Romero 1997: 103-159.

## **Methodology**

### 1. Master class

The teacher will perform an analytical conceptualization and an updated synthesis of each of the study topics shown.

The objective of this activity is to facilitate the transmission of knowledge and the motivation for the analysis of the

which are focused in order to promote active and cooperative learning.

### 2. Practical sessions

They are structured into four types of activities:

1) research, interpretation and analysis of macroeconomic variables, and presentation of a group work.

2) analysis of the result of a game, and

3) description and multicriteria analysis of an environmental conflict.

With these activities the students will not only consolidate the knowledge learned

in the master classes but will learn to do individual and group research, analyze information, synthesize it, defend

### 3. Tutorials

The process of learning and acquisition of competences will be supervised by the teacher through individual and

The teacher of the subject will be available to the students to solve the doubts and follow the evolution of the mer

competences of the students.

#### 4. Virtual campus of the subject

In face-to-face teaching, the Virtual Campus is a useful tool, so that students have a complementary space where

that the teacher considers essential to advance in the learning process of the subject. To access it you just have

(<http://www.uab.es/interactiva/default.htm>), or be directly on the campus webpage virtual (<https://cv2008.uab.cat/>

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

### Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Solving problems classes 1st part. Activities, exercises, data information research, debates	9	0.36	5, 2, 3, 4, 7, 6, 8, 9, 10, 11, 13, 1, 15, 14, 12
Solving problems classes 2nd part. Work development	9	0.36	5, 2, 4, 7, 6, 8, 9, 10, 11, 13, 1, 15, 14, 12
Teaching master class	40	1.6	5, 3, 9, 10, 13, 12
Type: Supervised			
Teaching laboratory preparation following the professor guide	30	1.2	5, 2, 10
Tutoring	10	0.4	
Type: Autonomous			
Bibliography search information	15	0.6	2, 15, 14
Reading and theory study	58	2.32	2, 15
Teaching laboratory preparation	23	0.92	2, 1, 15, 14



## Assessment

The evaluation of the subject will be based on the continuous evaluation of the process of acquisition of knowledge and skills by the students.

The evaluation of the first part is as follows:

- Group work on a topic related to the economics of climate change, which includes an oral presentation, which will score 25% on the final grade for the first part.
- Written test (75% of the mark for the first part) with two sections, the first one with 20 multiple-choice questions (50% of the mark) and the second one with two questions to be developed (50% of the mark).

The evaluation of the second part is as follows:

- A test that may combine multiple-choice and thematic questions and will count for 50% of the grade.
- A final essay of a maximum of 3,000 words, which will count for 50% of the grade. The essay will be in groups of up to 5 members and will include a presentation and discussion in class.

To average the different continuous assessment tests, it is required to obtain a minimum of 3 out of 10 in each of the tests.

Students who have failed the continuous assessment will have the right to a final theoretical exam. To be able to take the exam, the student must have been evaluated in a set of activities whose weight is at least 2/3 of the total grade for the subject

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Group essay (part 1)	12,5%	13	0.52	5, 2, 7, 6, 8, 9, 10, 11, 13, 1, 15, 14, 12
Group essay (part 2)	25%	14	0.56	5, 2, 3, 4, 7, 6, 8, 9, 10, 11, 13, 1, 15, 14, 12
Written test (part 1)	37,5%	2	0.08	5, 2, 7, 8, 9, 10, 11, 13, 1, 15, 12
Written test (part 2)	25%	2	0.08	5, 2, 3, 4, 7, 6, 8, 9, 10, 11, 13, 1, 15, 14, 12

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## **Software**

No need for specific software.