

Environmental Economics

Code: 102472 ECTS Credits: 6

Degree	Туре	Year	Semester
2501573 Economics	ОТ	3	2
2501573 Economics	ОТ	4	1

Contact

Name: Jesus Ramos Martin

Email: jesus.ramos@uab.cat

Teaching groups languages

You can check it through this <u>link</u>. To consult the language you will need to enter the CODE of the subject. Please note that this information is provisional until 30 November 2023.

Prerequisites

They have not been established.

Objectives and Contextualisation

The objective of the subject is twofold, on the one hand, to understand the basic concepts of economics that must allow us, on the other, to understand human systems as open systems for the entry of energy and materials and the exit of waste. In other words, the biophysical functioning of economies is studied, which is known as "social metabolism" and the role that natural resources have in maintaining the economic system.

The course also studies the application of economic theory to the analysis and management of natural resources. Decisions on renewable and exhaustible natural resources and on pollution can be based on the balance of monetary costs and benefits. But this approach has limitations. For this reason, the alternative of multi-criteria evaluation of resource management decisions is also proposed.

Competences

Economics

- Analyse situation in which there is unequal information between the two sides involved.
- Capacity for adapting to changing environments.
- Demonstrate initiative and work individually when the situation requires it.
- Formulate recommendations of economic policy that improve efficiency and equity in market operations.
- Identify the processes that govern the operation of markets in different competition systems, different scenarios of interrelationship and different timescales.

2023/2024

- Organise the work in terms of good time management, organisation and planning.
- Select and generate the information necessary for each problem, analyse it and take decisions based on that information.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
- Students must develop the necessary learning skills in order to undertake further training with a high degree of autonomy.
- Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
- Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
- Take decisions in situations of uncertainty, demonstrating an entrepreneurial and innovative attitude.

Learning Outcomes

- 1. A capacity of oral and written communication in Catalan, Spanish and English, which allows them to summarise and present the work conducted both orally and in writing.
- 2. Analyse the operating conditions of markets and other forms of social interaction.
- 3. Capacity to adapt to changing environments.
- 4. Consider formal models which can be used to study situations with information asymmetry between the parts.
- 5. Demonstrate initiative and work independently when required.
- 6. Identify the basic elements that characterise the organisation of a market.
- Identify the conditions and processes that generate externalities as well as the problems posed by public goods.
- 8. Identify the consequences of the existence of information asymmetry among different economic agents on the way in which these organise themselves and on the efficiency of the relationship they establish.
- 9. Make decisions in situations of uncertainty and show an enterprising and innovative spirit.
- 10. Organise work, in terms of good time management and organisation and planning.
- 11. Propose the optimum design of the institutions regulating the markets and of its equipment.
- 12. Solve the models formulated to obtain empirically stable predictions.
- 13. Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- 14. Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
- 15. Students must develop the necessary learning skills in order to undertake further training with a high degree of autonomy.
- 16. Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
- 17. Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
- 18. Use basic optimisation tools and the game theory, and include these elements in a theoretical model.

Content

1. Introduction. The economy as an open subsystem within the biosphere

Main economic figures and aggregates

The income cycle and the generation of added value

Natural resources in the economic process The laws of thermodynamics and their economic interpretation The arrow of time and evolution.

2. Monetary evaluation and the environment

Ecological value and economic value Families of economic valuation methods Total economic value Discount rate

3. Instruments of environmental economic policy

Externalities Optimal level of pollution Internalization of externalities Pigou and green taxation Coase and the emission rights market Payment for environmental services

4. Cost-benefit analysis

Economic and political democracy Arrow's impossibility theorem Kaldor-Hicks compensation criterion Relationship between efficiency and equity Risk, uncertainty and irreversibility

5. Multi-criteria evaluation

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

6. Ownership and access to natural resources

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

7. Analysis of non-renewable resources

Resource base and reserves The Hubbert curve Hotelling's rule: optimal resource extraction path Backstop technologies The rule of El Serafy EROI or energy rate of return on energy investment Nuclear energy, waste, time and discount

8. Analysis of renewable resources

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

9. Trade and environment

Determinants of trade: absolute and relative advantages Governance of international trade (WTO) Environmental implications of international trade Unequal exchange, unequal ecological exchange, and unequal caloric exchange

10. Economics and governance of biodiversity

The timeline of biodiversity governance: from the Convention on Biological Diversity (1992) to the Nagoya Protocol (2010) The generation of value from biodiversity (appropriation mechanisms) Nagoya Protocol and the Multilateral System of Access to Genetic Resources Fair and equitable distribution derived from access to genetic resources: monetary and non-monetary benefits

11. Economics and governance of climate change

Greenhouse effect and global warming Climate change governance (UNFCCC and IPCC) Kyoto Protocol, Paris Agreement, National Communications and NDC Compliance mechanisms: emissions markets, clean development mechanism, joint implementation.

12. Analysis of the metabolism of societies

Endosomatic and exosomatic energy consumption Exosomatic evolution of societies (Peak of oil) Material Flow Analysis Energy analysis, energy accounting, eMergy, exergy Multiscale Analysis of the Metabolism of Societies (MuSIASEM)

Methodology

1. Master class and guided debates

The teacher will perform an analytical conceptualization and an updated synthesis of each of the study topics shown in the teaching units. The aim of this activity is to facilitate the transmission of knowledge and motivation for the analysis of the relationship between human activity and the environment, which are focused in order to promote active and cooperative learning.

2. Practical sessions

The practical sessions will consist of presentations and the semi-structured discussion that defines the group. This activity will also serve to relate the fundamental concepts of the subject and give proposals for resolving conflicts both from the perspective of Environmental Economics and from the perspective of Ecological Economics.

3. Tutorials

The learning process and acquisition of skills will be supervised by the teacher through individual and / or group tutorials. The teacher will be available to students to resolve doubts and follow the evolution of the aforementioned process of learning and acquisition of skills of students.

4. Virtual Campus of the subject

Inface-to-face teaching, the Virtual Campus is a useful tool, so that students have a complementary space where they can access different types of materials that the teacher considers basic to advance in the learning process of the subject. To access it, all you have to do is go to the UAB website and there you will find the link, or directly to the website of the virtual campus (https://cv.uab.cat/portada/ca/).

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.

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					
Lecture	32.5	1.3	2, 3, 1, 6, 7, 8, 5, 10, 4, 9, 11, 12, 18		
Practical sessions: Development of group work, presentation and discussion in class	17	0.68	2, 1, 5, 10, 9, 12		
Type: Supervised					
Tutorials and follow-up of the work to be carried out	7.5	0.3	2, 3, 1, 6, 7, 8, 5, 10, 4, 9, 11, 12, 18		
Type: Autonomous					
Reading and studying theory	70	2.8	2, 1, 6, 8, 10, 12		
Search for information	17	0.68	5		

Assessment

Assessment

CONTINUOUS EVALUATION

The evaluation of the subject will be based on a continuous evaluation of the process of acquisition of knowledge and skills by the student and will consist of:

- 2 partial knowledge exams that may combine multiple choice and thematic questions and that will count for 35% of the final grade each.

- A final essay, which will count for 30% of the final grade.

COMPREHENSIVE EVALUATION

By requesting the comprehensive evaluation the student waives the option of continuous evaluation.

The comprehensive evaluation must be requested at the Academic Management (Gestió acadèmica) of the Campus where the degree/master's degree is taught. The request must be filed according to the procedure and the deadline established by the administrative calendar of the Faculty of Economics and Business.

 Student attendance is mandatory on the day of the comprehensive assessment. The date will be the same as that of the final exam of the semester as per the evaluation calendar published by the Faculty of Economics and Business and approved by the Faculty's Teaching and Academic Affairs Committee. The duration of the comprehensive assessment must be specified in the characteristics of such activity.

- 100% of the evaluation evidences must be handed in by the student on the day of the comprhensive assessment.
- The evaluation evidences carried out in person by the student on the same day of the comprehensive assessment must have a minimum weight of 70%.

Evidence Type	Weight in the final assessment (%)	Duration of the activity	Is the activity that corresponds to this evaluation evidence to be carried out in person on the date scheduled for the comprehensive evaluation? (YES/NO)
Exam	70%	Зh	Yes
Essay	30%		No
TOTAL	100%		

For the retake procedure, no distinction is made between students who have followed the continuous evaluation and those who have opted for the comprehensive evaluation. All will be re-assessed using the same test or evaluation evidence.

The review of the final qualification will follow the same procedure as for the continuous evaluation.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Final Essay	30	2	0.08	2, 1, 7, 9, 11, 16, 12
First partial exam	35	2	0.08	17, 3, 6, 8, 5, 4, 15, 18
Second partial exam	35	2	0.08	2, 3, 1, 6, 7, 8, 5, 10, 4, 9, 11, 14, 13, 12, 18

Bibliography

BIBLIOGRAPHY (basic one in bold characters)

Common, Michael S., and Sigrid Stagl (2005). *Ecological Economics: an Introduction.* Cambridge: Cambridge University Press. https://bibcercador.uab.cat/permalink/34CSUC_UAB/1eqfv2p/alma991010751826406709

Daly, Herman E., and Joshua C. Farley (2011). *Ecological Economics: Principles and Applications*. 2nd ed. Washington: Island Press. https://bibcercador.uab.cat/permalink/34CSUC_UAB/1eqfv2p/alma991001531189706709

Costanza, R., Segura, O., & Martínez Alier, J. (1996). *Getting down to earth: practical applications of ecological economics*. Island Press. https://bibcercador.uab.cat/permalink/34CSUC_UAB/1egfv2p/alma991004699359706709 Martínez Alier, Joan., and Klaus Schlüpmann (1987). *Ecological Economics: Energy, Environment and Society* . Oxford: Basil Blackwell. https://bibcercador.uab.cat/permalink/34CSUC_UAB/1eqfv2p/alma991001038929706709

Padilla Rosa, E. and Ramos-Martin, J. (Eds.) (2023): *Elgar Encyclopedia of Ecological Economics*. Cheltenham: Edward Elgar Publishing Ltd. ISBN: 978-1-80220-040-9.

Villamayor-Tomas, Sergio., and Roldan. Muradian (Eds.) (2023). *The Barcelona School of Ecological Economics and Political Ecology A Companion in Honour of Joan Martinez-Alier*. Cham: Springer International Publishing. <u>https://bibcercador.uab.cat/permalink/34CSUC_UAB/1eqfv2p/alma991010787421306709</u>

Software

There is no need for specific software.