Course guide
480011 - EEAE - Fundamentals of Economics, Environmental Economics and Ecological Economics

Last modified: 07/06/2023

Unit in charge: Barcelona School of Civil Engineering
Teaching unit: 745 - DEAB - Department of Agri-Food Engineering and Biotechnology.

Degree: MASTER'S DEGREE IN SUSTAINABILITY SCIENCE AND TECHNOLOGY (Syllabus 2013). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 5.0 **Languages:** Spanish

LECTURER

Coordinating lecturer: JOSE MARIA GIL ROIG

Others: ZEIN KALLAS

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
3. The ability to critically analyse and assess theories, strategies and policies on development and sustainability; perspectives on the sustainability paradigm, discussions within the field and its environmental, social, cultural and economic implications; the particularities of and differences between environmental and ecological economics; and the problems of valuing goods, services, resources and externalities economically.
4. The ability to apply, critically analyse results and assess valorisation theories, approaches and methods in the fields of food and rural development and agricultural, water, energy, building construction, transport and spatial engineering.
5. The ability to integrate knowledge of integrated management of the natural environment and natural resources, particularly water and energy resources, in the development and proposal of scientific and technological solutions to challenges to sustainability.

Generical:
CG03. The ability to analyze, evaluate and synthesize, critically, new and complex ideas and promote, within academic and professional, scientific, technological, social or cultural knowledge society contexts.

Transversal:
2. FOREIGN LANGUAGE: Achieving a level of spoken and written proficiency in a foreign language, preferably English, that meets the needs of the profession and the labour market.

1. SUSTAINABILITY AND SOCIAL COMMITMENT: Being aware of and understanding the complexity of the economic and social phenomena typical of a welfare society, and being able to relate social welfare to globalisation and sustainability and to use technique, technology, economics and sustainability in a balanced and compatible manner.

Basic:
CB7. That students can apply their knowledge and ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field d'study.

TEACHING METHODOLOGY

The following teaching methods will be used in the development of the course:

Lecture or conference (EXP): Sharing knowledge through lectures by professors or by external guest speakers.
Problem solving and case studies (RP): group decision exercises, debates and group dynamics, with the teacher and students in the classroom; class presentation of an activity carried out individually or in small groups.
Tutorials of practical or theoretical works (TD): to perform an activity in the classroom, or a theoretical or practical exercise, individually or in small groups, with the advice of the teacher.
Carry out a project, activity or work of reduced scope (PR): to carry out, individually or in a group, of a homework assignment of reduced complexity or scope, applying knowledge and presenting results.
Evaluation Activities (EV)

Training activites:

The following training activities will be used in the development of the course:

Face-to-face
Theoretical classes and conferences (CTC): knowledge, understanding and synthesis of contents presented by the lecturer (professor) or by guest speakers.
Practical classes (CP): participation in group exercises, as well as discussions and group dynamics, with the teacher and other students in the classroom.
Theoretical/practical work tutorials (TD): carry out in the class an activity or exercise, theoretical or practical in nature, individually or in small groups, with the advice of the professor.

Remote
Carry out a project, activity or work of reduced scope (PR): to carry out, individually or in a group, of a homework assignment of reduced complexity or scope, applying knowledge and presenting results.
Autonomous study (EA): study or development of the subject individually or in groups, understanding, assimilating, analysing and synthesising knowledge.

LEARNING OBJECTIVES OF THE SUBJECT

At the end of the Course, the student:

Will know main concepts of Economics, methodologies to evaluate goods (prívate and public), services and resources as well as social and environmental costs associated to the economic activity and, finally, will be able to make critical assessments of economic activity from considering potential

Will know the basic principles of the neoclassical theory and the main epistemological differences between environmental and ecological economics and will be able to read and understand economic texts around the public debate about the environmental conservation.

STUDY LOAD

Type	Hours	Percentage
Self study	80,0	64.00
Hours medium group	12,0	9.60
Hours small group	9,0	7.20
Hours large group	24,0	19.20

Total learning time: 125 h

CONTENTS

1- Introduction to Economics

Description:
Basic economic concepts. Supply, demand, prices. The concept of elasticity. Macroeconomics and main indicators. Introduction to Sustainable development. Ecological efficiency. Resilience.

Specific objectives:
To introduce students to main concepts of Economics and Sustainable development.

Related activities:
Activity 1: Introduction to Economics

2- Environmental Economics

Description:
Economics and Environment. Alternative approaches to analyze the relationship between economics and the environment: Environmental and Ecological Economics. Monetary valuation of natural resources: supply, demand and the equal marginality principle. Externalities and valuation methods: market failures, externalities, public goods, open Access goods and market power. Economic efficiency and distribution. Environmental Accounting. Cost benefit Analysis.

Specific objectives:
To analyze the relationship between economics, ecology and the environment in a sustainable development framework and to be able to integrate the sustainable principles in the socioeconomic analysis to design strategies, indicators and models to be applied in real case studies.

Related activities:
Activity 2: Environmental Economics

3- Ecological Economics

Description:
The valuation problem from the ecological economics perspective. Critics to the Environmental Economics. Principles of Ecological economics: unfeasibility of the unlimited economic development with limited natural resources. Economics and thermodynamics: the physical limits. Systems hierarchy. Tools in ecological Economics. Material fluxes accountancy (MFA). Human appropriation on Net primary production (HANPP). Life Cycle Analysis (ACV). The ecological footprint.

Specific objectives:
To understand and use ecosystem state indicators. To know the main limitations of valuation methods of environmental assets.

Related activities:
Activity 3. Ecological Economics

4- Practical Work

Description:
The student will have to elaborate a formal final work of about 25 pages related to the course content. It consists of a critical literature review on a specific issue related to the course.

Specific objectives:
To evaluate the student's ability to make a critical literature review, a basic step in any research work. To evaluate to what extent students are able to understand and use properly the main concepts and tools provided by the Neoclassical, Environmental and Ecological Economics.

Related activities:
Activity 4: Delivery of Practical work

ACTIVITIES

INTRODUCTION TO ECONOMICS

Description:
To solve some exercises related to activity content.

Specific objectives:
To assess to what extent students have learned theoretical concepts.

Delivery:
Individual 5-page practical work consisting in answering to practical exercises and problems related to activity content (in PDF).

ENVIRONMENTAL ECONOMICS

Description:
To make a critical assessment of a scientific paper related to the activity 2 content.

Specific objectives:
To evaluate the students' ability to make a critical assessment and to manage academic

Delivery:
PDF file

ECOLOGICAL ECONOMICS

Description:
To make a synthesis report about the concept of Ecological Economics.

Specific objectives:
To assess the students' skills to differentiate between environmental and ecological economics.

Delivery:
Five-page PDF file

FINAL WORK

Description:
Final work on any topic related to course content

Specific objectives:
To assess the students' skill to make a critical literature review as well as their learning skills about the course content.

Delivery:
Twenty-five-page PDF file

FINAL EXAM

Description:
Final exam

Specific objectives:
To assess students' learning skills through short questions and a case study.

Delivery:
Written exam

GRADING SYSTEM

EV1: Written test (PE). 45%
EV2: Oral test (PO). 0%
EV3: Individual or group coursework (TR). This includes results and reports and their oral presentation. 45%
EV4: Class and laboratory attendance and participation (AP). 5%
EV5: Performance and quality of group work (TG). 5%

BIBLIOGRAPHY

Basic:

- Azqueta, D. Introducción a la economía ambiental [on line]. 2a ed. Madrid: McGraw Hill, 2007 [Consultation: 16/03/2021]. Available on: https://ebookcentral.proquest.com/lib/upcatalunya-ebooks/detail.action?docID=3195155. ISBN 9788448178048.
- Field, B.C.; Field, M.K. Economía del medio ambiente. 3a ed. Madrid: McGraw-Hill, 2003. ISBN 8448139437.
- Aguilera, F.; Alcántara, V. (Comp.). De la economía ambiental a la economía ecológica [on line]. 1a ed., ed. electr. rev. Barcelona: CIP-Ecosocial, 2011 [Consultation: 02/02/2021]. Available on: https://drive.google.com/file/d/1q1jJxbcMgAjoVfOjQ2atx8HOmmkYPjTw/view. ISBN 8474262313.
- Martínez Alier, J. Introducció a l'economia ecològica. Barcelona: Rubes : Generalitat de Catalunya, Departament de Medi Ambient, 1999. ISBN 8449700833.
- "Cap 2: Metabolismo económico y huella ecológica: la sostenibilidad como un problema del tamaño o escala de la economia". Carpintero, O. El metabolismo de la economía española: recursos naturales y huella ecológica (1955-2000) [on line]. Teguise, Islas Canarias: Fundación César Manrique, 2005. [Consultation: 11/02/2021]. Available on: http://www.fcmanrique.org/recursos/publicacion/elmetabolismo.pdf.

Complementary:

- Kapp, K.W. "El carácter abierto de la economía y sus implicaciones". Doepfer, K. La economía del futuro: hacia un nuevo paradigma. México: Fondo de Cultura Económica, 1978.
- Daly, H.E. "Georgescu-Roegen versus Solow/Stiglitz". Ecological Economics [on line]. September 1997, vol. 22, issue 3, pp. 261-266 [Consultation: 09/03/2021]. Available on: https://www-sciencedirect-com.recursos.biblioteca.upc.edu/science/article/pii/S0921800997000803.- Fischer, D.W. "Sobre los problemas de medición de los beneficios y los costes ambientales". Aguilera, F.; Alcántara, V. (comp.). De la economía ambiental a la economía ecológica [on line]. Barcelona : Madrid: Icària : FUHEM, 1994. pp. 110-120 [Consultation: 02/02/2021]. Available on: http://www.fuhem.es/media/ecosocial/File/Actualidad/2011/Fischer.pdf.- "La ley de la entropía y el problema económico". Daly, H.E. Economía, ecología y ética: ensayos hacia una economía en estado estacionario. México: Fondo de Cultura Económica, 1989. pp. 61-72.
- Naredo, J.M.; Gutiérrez, L. (coord.). La incidencia de la especie humana sobre la faz de la tierra : (1955-2005). Granada: Universidad de Granada : Fundación César Manrique, 2005. ISBN 843383519X.

RESOURCES

Other resources:
Class notes