Academic Year/course: 2022/23

61339 - Environment, Growth and Industrial Ecology

Syllabus Information

Academic Year: 2022/23
Subject: 61339 - Environment, Growth and Industrial Ecology
Faculty / School: 109 - Facultad de Economía y Empresa
Degree: 525 - Master's in Economics
ECTS: 3.0
Year: 1
Semester: Second semester
Subject Type: Optional
Module:

1. General information

1.1. Aims of the course

The subject and its expected results respond to the following approaches and objectives:
The student will understand the instruments to evaluate the relations between human activity and the natural systems.
It is also intended that the student becomes familiar with the resolution and representation of main economic-environmental problems.

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the 2030 agenda (
https://www.un.org/sustainabledevelopment/es/), contributing to some extent to their achievement:
Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Goal 6: Clean Water and Sanitation

Goal 7: Affordable and clean energy

Goal 12: Ensure sustainable consumption and production patterns

Goal 13: Climate action

1.2. Context and importance of this course in the degree

Nowadays, there is a clear consensus on the need of instruments to evaluate and design economic and environmental policies aiming at achienving a triple-dividend (economic, social and environmental). In this context, the course attempts to offer theoretical and methodological foundations and models for the desing and evaluation of such policies, with a particular focus on the quantitative estimation of socio-economic and environmental impacts and on the relationship between environment and growth, both at the local and global level.

1.3. Recommendations to take this course

The course is self-contained. However, it is expected that the student will have a basic background in mathematics and economic theory.
Some competence in Excel and a basic knowledge of mathematical modelling software such as MatLab or Mathematica is also reccomended.

2. Learning goals

2.1. Competences

Upon successful completion of the course, the student will be more competent to...

- Understand the interaction between economic growth and the environment, as well as the economic and social effects linked to the exploitation of natural resources, in a context of increasing globalisation.

In particular, the students will acquire the following competences

BASIC AND GENERAL
- To be able to analyse the different dimensions of the environment from a multidisciplinary and systemic perspective, both at a theoretical and applied level.
- To be able to design responses to emerging challenges in a plural and complex society, through the evaluation of economic, social and environmental policies at different decision-making levels.
SPECIFIC
- To be able to identify the environmental challenges and problems to which economics can provide a response.
- To be able to quantify and economically understand the different elements involved in the relationship between the economy and the environment.
- Assess the role of globalisation in the environment.

2.2. Learning goals

By the end of this course, students will be able to
- Understand the basic notions of environmental sustainability
- Know the basic techniques of analysis and estimation of environmental impacts, especially those associated with multi-sectoral and multi-regional techniques and the most recent ones of industrial ecology.
- Be able to make quantitative valuations of environmental assets and impacts.
- Understand the interdependence between environment, economy and growth and to understand different approaches to capture and evaluate this interdependence.

2.3. Importance of learning goals

The demand for knowledge and basic and applied research on the connections between socio-economic development and the environment has grown steadily over the last three decades, attracting increasing attention from international organisations, government agencies and economic literature that studies this subject.
The subject covered by the course orients the student towards a field with very diverse and abundant professional opportunities in the areas of environmental consultancy, governmental and international environmental agencies, the environmental departments of companies, the development and implementation of new clean technologies from both the private and public point of view, everything related to the restructuring of the energy model (urban planning, transport, etc.) in the face of Climate Change and public environmental management agencies, among others.

3. Assessment (1st and 2nd call)

3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

The student must demonstrate that he/she has achieved the expected learning outcomes by means of the following activities
Assessment system Weighting
- Continuous assessment: individual projects, participation in classes and global objective tests

(Minimum 100%; maximum 100%)

- Global assessment: Final exam (Minimum 100%; maximum 100%)

Course assessment will be onsite. In the case of a new pandemic wave assessment will become partly online or fully online. It should be noted that in any online assessment task the student performance may be recorded, following the regulations described in: ?https://protecciondatos.unizar.es/sites/protecciondatos.unizar.es/files/users/lopd/gdocencia_reducida.pdf?_

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, student participation, autonomous work (study, class preparation, readings, exercises, research topics).

For some topics, computer-related tools are necessary.

All lectures and seminars will be imparted on site. In the case of a new health emergency caused by the current pandemic all teaching will be moved online.

4.2. Learning tasks

The course includes the following learning tasks:

- Lectures and practice sessions (25 hours): compulsory attendance
- Autonomous work (45 hours): course work and project preparation and study
- Presentation and defense of projects (5 hours): compulsory attendance

4.3. Syllabus

The course will address the following topics:

    I. INTRODUCTION
    1. SUSTAINABILITY AND GLOBAL ENVIRONMENTAL PROBLEMS.
    2. AN EXAMPLE OF INTERDISCIPLINARY ANALYSIS. THE PROBLEM OF REVEGETATION
    II. GROWTH AND ENVIRONMENT: MULTI-SECTORAL MODELS, ENVIRONMENTAL ASSESSMENT AND EXTENSION
    3. MULTI-SECTORAL MODELS (I)
    4. MULTI-SECTORAL MODELS (II): Social and environmental extensions .
    5. ASSESSMENT OF INFLUENCE, DEPENDENCE AND EVOLUTION IN A MULTI-SECTORAL FRAMEWORK
    III. ECOLOGICAL FOOTPRINTING and ENVIRONMENTAL RESPONSIBILITY
    6. TOP-DOWN AND BOTTOM-UP PERSPECTIVES FOR APPROACHING THE ENVIRONMENTAL FOOTPRINT
    7. RESPONSIBILITY OF CONSUMPTION, PRODUCTION AND INCOME
    8. ENVIRONMENTAL RESPONSIBILITY AND INTERNATIONAL TRADE
    9. ENVIRONMENTAL ISSUES AND LOCAL IMPACTS
    IV. APPLIED GENERAL EQUILIBRIUM MODELS FOR THE STUDY OF ENVIRONMENTAL IMPACT
    10.INTRODUCTION TO MEGAs
    11. SCENARIO DESIGN AND ANALYSIS
    12. OTHER APPLICATIONS AND EXTENSIONS

4.4. Course planning and calendar

Further information concerning the timetable, classroom, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the Master's website.

4.5. Bibliography and recommended resources

Throughout the course, students will be provided with a set of recommended readings to follow the course.