

Academic Year: (2018 / 2019)

Review date: 31-07-2017

Department assigned to the subject:

Coordinating teacher: USAOLA GARCIA, JULIO

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester :

STUDENTS ARE EXPECTED TO HAVE COMPLETED

Prior knowledge on renewable energies is not required, but there should be an interest and willingness to acquire knowledge about renewable energy technology, economy and regulation.

COMPETENCES AND SKILLS THAT WILL BE ACQUIRED AND LEARNING RESULTS.

After this course, the student should be able to:

- distinguish between renewable and non-renewable resources
- identify the main renewable energies, including the resources they use, the existing technology as well as their strengths and weaknesses
- to estimate the costs and subsidies of energy and in particular of renewable energies
- to be able to seek reliable information on energy and in particular on renewable energies.
- determine the implementation of renewable energies in Spain,
- to know the historical evolution of this implementation, as well as the problems that have arisen in it
- to be able to seek updated and reliable information on the regulation of renewables in Spain, their degree of implementation and their cost

DESCRIPTION OF CONTENTS: PROGRAMME

- Introduction
- Energy and development. Sustainability
- Energy in history.
- Effects of energy use: pollution and climate change
- Renewable and non-renewable energy resources.
- Renewable energies.
- Renewable energy technology and its implementation: solar, wind, hydro, biomass.
- Integration of renewable energies into electrical systems and markets
- Cost of renewable energy. Subsidies to energy
- Development in Spain: lights and shadows.
- Renewable resources in Spain and implementation of renewable energies in Spain
- Implementation objectives in Spain and the European Union.
- Spanish legislation on renewables: historical development and current situation
- The cost of integrating renewable energies
- Current situation and debates in Spanish society on renewable energies.

LEARNING ACTIVITIES AND METHODOLOGY

- Formative activities
- Theoretical and practical theory classes
- Team work
- Individual student work
- Teaching method
- Exhibitions in the teacher's class with support of computer and audiovisual media, in which the main concepts of the subject are developed and the bibliography is provided to complement the students' learning.
- Resolution of practical cases, problems, etc. ... raised by the teacher individually or in a group
- Exposition and discussion in class, under the moderation of the professor of subjects related to the content of the subject, as well as of practical cases.
- Elaboration of papers and reports individually or in groups.

ASSESSMENT SYSTEM

The evaluation will be made in the following way:

Attendance and continuous assessment activities: 25%

Group discussions: 25%

Final essay: 25% (subject freely chosen by the student)

Exams: 25%

The final grade will be reduced depending of the unjustified absences

1st not justified absence: -0,3

2º not justified absence: -0,5

3th not justified absences means to fail the complete course.

BASIC BIBLIOGRAPHY

- AA.VV Manual de la energía, Energía y Sociedad.
- AA.VV. Encyclopedia of Energy, Elsevier, 2004
- Ian W H Parry, Dirk Heine, Eliza Lis, Shanjun Li Getting Energy Prices Right : From Principle to Practice., International Monetary Fund, 2012
- Intergovernmental Panel on Climatic Change. Climate Change 2014. Synthesis Report., IPCC, 2014
- J.W. Tester et al. Sustainable Energy. Choosing Among Options, The MIT Press, 2012

ADDITIONAL BIBLIOGRAPHY

- null Spanish and UE regulation and laws., BOE and others.

BASIC ELECTRONIC RESOURCES

- . International Energy Agency Roadmaps: [http://](http://www.iea.org/roadmaps/) <https://www.iea.org/roadmaps/>