

Subject	ENERGY SYSTEM: MARKETS, TECHNOLOGIES AND PERSPECTIVES
Credits	4 ECTS (4T+1P)
Character	Compulsory
Semester	1st
Language	English

Competences

CG5 - Informationmanagement: to search for and manage appropriate bibliographic resources efficiently, to learn to continue studies in a largely autonomous way as a basis for future research and innovation activity.

CG8 - Apply methodologies, procedures, tools and state-of-the-art standards for the creation of new technological components; build new hypotheses and models, evaluate them and apply them to problem solving.

CG9 - Communicate judgments and knowledge to specialized and non-specialized audiences in a reasoned, clear and unambiguous manner.

CB6 - Possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context

CB7 - Students should be able to apply their acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study.

CB8 - Students are able to integrate knowledge and face the complexity of making judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities related to the application of their knowledge and judgments.

CB9 - Students should be able to communicate their conclusions and the ultimate knowledge and rationale behind them to specialized and non-specialized audiences in a clear and unambiguous manner.

CB10 - That students possess the learning skills that will enable them to continue studying in a manner that will be largely self-directed or autonomous.

CT3 - Use of the English language: understand the contents of lectures, conferences and seminars in English; write reports and scientific-technical articles in English using computer tools; make public presentations in English of research work, results and conclusions, for example, in the subjects of the Master or in congresses of a mostly international nature or in stays in foreign centers, all with the help of audiovisual computer media

CT4 - Team leadership: to carry out team work (such as those of some of the evaluation activities of the subjects), to integrate into a research group by actively participating in its meetings, collaborating with own initiative in R+D+i works or projects; to interact effectively with the members of the multidisciplinary work team.

CE1 - Understanding, analyzing and judging the relevance of any contribution in this field, in relation to its social, energetic and scientific-technical environment.

CE6 - Apply design methodologies and implementation of automatic learning and classification techniques for intelligent knowledge management.

Outcomes

RA04 - Ability to analyze results

RA05 - Relate basic principles to practical aspects.

RA26 - Knowledge of the evolution of the different energy models.

RA28 - Understanding and analyzing the different sources and types of energy.

RA45 - To train the student to make presentations in public.

RA46 - To train the student to work in a team.

RA47 - To learn to argue convincingly

Description and syllabus

The overall objective of this course is to consolidate and broaden the general energy knowledge, in a broad sense, of students who will become experts in a particular energy field such as Solar Photovoltaic Energy. Postgraduate courses are necessarily specific, so it is mandatory to raise your head, look around and understand the broad context. This general objective will be achieved by accomplishing this set of specific objectives:

- To think about the definition and concept of Energy.
- To know the energetic evolution of mankind.
- To understand the energetic situation of our world.
- To understand the energy situation of our contemporary world.
- To analyze the role of fossil fuels in the world energy system.
- To define and understand what Renewable Energies are.
- To develop a basic knowledge of the future energy technologies currently foreseen in basic research.

Schematically, the syllabus includes:

1. Basic concepts about energy.
 - 1.1. Basic concepts about energy and energetic machines.
 - 1.2. Energy in the history of mankind
2. World energy structure
 - 2.1. World energy system
 - 2.2. World electricity system
 - 2.3. Fossil fuels
 - 2.4. Renewable energies
3. Markets and impacts
 - 3.1. Energy and ecology
 - 3.2. Energy and climate change

3.3 Energy and gender

3.4 Energy and food chain

3.5 Energy and transportation

4. Future and emerging energy technologies

4.1. Energy storage

4.2 Hydrogen energy

4.3. Clean coal technologies

4.4. Nuclear fusion