Universidad Zaragoza

Academic Year/course: 2023/24

69767 - Suplementary Course in Physics

Syllabus Information

Academic year: 2023/24
Subject: 69767 - Suplementary Course in Physics
Faculty / School: 100 - Facultad de Ciencias
Degree: 627 - Master's Degree in Circular Economy
ECTS: 3.0
Year: 01
Semester: First semester
Subject type: ENG/Complementos de Formación
Module:

1. General information

The subject *Complementary Physics* allows students to acquire the necessary knowledge and skills in physics to adequately follow the compulsory and elective subjects of the Master's Degree in Circular Economy. The *Complementary Physics* subject is taught during the first months of the Master in Circular Economy. This subject is mainly aimed at students who have a degree in the macro area of social and legal sciences. The subject is taught at the University of Zaragoza.

It is aligned with Sustainable Development Goal (SDG) No. 12 (Responsible Production and Consumption) of the United Nations 2030 Agenda(https://www.un.org/sustainabledevelopment/es/), so that the acquisition of its learning results provides training and competence to contribute to some extent to the achievement of the Goal.

2. Learning results

- To be able to recognize the concept of energy as a capacity to produce change.
- To be able to argue that energy can be transferred, stored or dissipated, but not created or destroyed, using examples.
- To be able to define energy and power as quantities, expressing them in the most common units.
- To be able to identify the different types of energy and the transformations of one into another.
- To be able to identify the main energy sources of industrial interest.
- To be able to identify the mechanisms of energy transport.
- To understand the limitations that the phenomenon of energy degradation poses for the design of energy production, transportation and consumption systems.

3. Syllabus

Topic 1. Physical concept of energy. Force and acceleration. Kinetic and potential energy. Work of a force.

Topic 2. First principle of thermodynamics. Heat and work. Thermal machine.

Topic 3. Second principle of thermodynamics. Maximum performance of a machine. Irreversible processes: non-idealities and friction.

Topic 4. Energy. Types of energy. Energy sources. Energy transformation and transportation. Energy consumption and storage.

4. Academic activities

Master class: 8 hours

Group sessions of 50 minutes each. Teachers explain the theoretical contents and solve representative applied problems. The learning materials will be available on the Moodle virtual platform. Regular class attendance is strongly recommended.

Problem solving and case studies: 22 hours, including 4 face-to-face hours

Students must solve problems.

Study and personal work: 42 hours

Students must study theory and prepare for the final test.

Assessment tests: 3 hours.

Students take a final short answer, long answer and/or open-ended questions test.

5. Assessment system

The assessment tests will consist of written statements that may be require a short answer, long answer and/or an answer than involves further writing. The subject´s assessment is conducted using a single test that constitutes 100% of the grade.

Notwithstanding the above, there is a continuous assessment system during the period established for the teaching of the subject. Those students who wish to be assessed through this system must submit a series of mandatory assignments, according to the deadlines set during the term. If the assessment of these works is satisfactory, the student is entitled to take a single written test (continuous assessment), that, as in the global assessment, equals to 100% of the grade. The writing of the continuous assessment test will not imply in any case that any of the global assessment calls has been used. However, if the student passes this test, the corresponding grade would be considered for the assessment of the first call. In addition, students who obtain a grade through continuous assessment are entitled to write the global assessment test in the first call. In such case, the final grade will correspond to the higher of the two grades obtained in both systems.