Universidad Zaragoza

Academic Year/course: 2023/24

25869 - Physics II

Syllabus Information

Academic year: 2023/24
Subject: 25869 - Physics II
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 558 - Bachelor's Degree in Industrial Design and Product Development Engineering
ECTS: 6.0
Year: 1
Semester: First semester o Second semester
Subject type: Basic Education
Module:

1. General information

Physics II provides the basic concepts and laws related to electromagnetic fields, their meaning and experimental basis, as well as a detailed analysis of Maxwell's equations in integral form. It also shows the wave concepts from a general point of view as well as the detailed analysis of the peculiarities of those wave phenomena of interest in engineering: waves in solids and fluids (acoustics), electromagnetic waves and optics.

The assessable contents of Physics II, by themselves, do not provide the student with any of the skills that contribute to the achievement of the 2030 Agenda. However, the contents of Physics II are essential for the foundation the subsequent knowledge of the rest of the degree, which are more directly related to the SDGs of the 2030 Agenda.

2. Learning results

- Knows the main properties of electric and magnetic fields, the classical laws of electromagnetism that describe and relate them, their meaning and their experimental basis.
- Knows and uses the concepts related to capacitance, electric current, self-induction and mutual induction, as well as basic electrical and magnetic properties of materials .
- Knows the wave equation, the characteristic parameters of its basic solutions and their energetic aspects. Analyses the propagation of mechanical waves in fluids and solids and knows the fundamentals of acoustics.
- Recognizes the properties of electromagnetic waves, the basic phenomena of propagation and superposition, the electromagnetic spectrum, the basic aspects of light-matter interaction and the applications of these phenomena in technology

3. Syllabus

- Unit 1: Static electric fields.
- Unit 2: Electric current.
- Unit 3: Static magnetic fields.
- Unit 4: Electromagnetic induction. Maxwell's equations.
- Unit 5: Waves in solids and fluids. Acoustics.
- Unit 6: Electromagnetic waves.
- Unit 7: Optics.

4. Academic activities

The planned learning activities are as follows:

- Classroom and laboratory activities: Lectures (30 hours), problems and cases (15 hours), laboratory practices (10 hours).
- Activities outside the classroom and laboratory: Personal study and work (89 hours), evaluation tests (6 hours).

5. Assessment system

The subject will be evaluated in the global assessment modality, but a midterm test will be scheduled during the school period in order to facilitate the gradual passing of the subject.

Assessment throughout the semester.

- Written test on topics 1 to 4 at mid-semester (42 % grade). If the grade is at least 4.5 out of 10, this type of assessment may be continued.

- At the end of the semester, there will be a written test on topics 5 to 7 (33% grade).

- Exam on laboratory practices, (20% grade), by means of a written exam if the practical sessions have been attended .
- Throughout the semester, group or individual work will be done (5% of the final grade).

Global assessment

- Examination of topics 1 to 7 (75% grade).
- Exam on laboratory practices, (20% grade), by means of a written exam if the practical sessions have been attended . Students who have not completed the practical sessions will be additionally evaluated by means of a practical exam in the laboratory.
- Presentation of a group or individual work (5% of the final grade)