

29807 - Physics II

Syllabus Information

Academic year: 2024/25

Subject: 29807 - Physics II

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

326 - Escuela Universitaria Politécnica de Teruel

Degree: 440 - Bachelor's Degree in Electronic and Automatic Engineering

444 - Bachelor's Degree in Electronic and Automatic Engineering

ECTS: 6.0

Year: 1

Semester: 440-First semester o Second semester

107-Second semester

444-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 the 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 and optics.

The assessable contents of Physics II, in isolation, 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 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

- Analyze problems that integrate different aspects of physics, recognizing the various physical fundamentals underlying a technical application, device, or real system.
- Know the units, orders of magnitude of defined physical quantities and solves basic engineering problems, expressing the numerical result in the appropriate physical units.
- Correctly use basic methods of experimental measurement or simulation and treat, present and interpret the data obtained, relating them to appropriate physical magnitudes and laws.
- Use bibliography, by any of the means currently available, and use clear and precise language in their explanations of physics questions.
- Know the main properties of electric and magnetic fields, the classical laws of electromagnetism that describe and relate them, their meaning and their experimental basis .
- Know and uses the concepts related to capacitance, electric current, self-induction and mutual induction, as well as basic electrical and magnetic properties of materials .
- Know the wave equation, the characteristic parameters of its basic solutions and the energetic aspects of them. Analyze the propagation of mechanical waves in fluids and solids and knows the fundamentals of acoustics.
- Recognize 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

- Static electric fields.
- Electric current.
- Static magnetic fields.
- Electromagnetic induction. Maxwell's equations.
- Waves in solids and fluids. Acoustics.
- Electromagnetic waves.
- Optics.

4. Academic activities

Río Ebro Campus (Zaragoza).

The planned learning activities are as follows:

- Lectures (33 horas).

- Problems and cases (15 hours).
- Laboratory practices (12 hours).
- Personal study and work (84 hours).
- Assessment tests (6 hours)

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5. Assessment system

Río Ebro Campus (Zaragoza).

The subject will be evaluated in the global evaluation mode, but an intermediate test will be scheduled during the school term to facilitate the gradual overcoming of the subject.

Assessment throughout the semester.

- Written test on topics 1 to 4 at mid-semester (45% 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, a written test on topics 5 to 7 will be given (35% grade).
- Examination on the laboratory practices, (20% grade), by means of a written exam if the student has attended the practical sessions.

Global assessment.

- Examination of topics 1 to 7 (80% grade).
- Examination on the laboratory practices, (20% grade), by means of a written exam if the student has attended the practical sessions. Students who have not completed the practical sessions will be additionally evaluated by means of a practical exam in the laboratory.

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Summative assessment throughout the semester (obtain 40% of the maximum grade in each test):

- Intermediate test of the contents developed up to that moment. Does not eliminate subject (20% of the grade).
- Laboratory activity, a report of each practice supervised by the teacher will be made (20% of the grade).
- Overall written test of the subject (60% of the grade).

Global assessment.

- If a 4 has not been obtained in the intermediate test, overall written test of the subject (80% of the grade).
- If a 4 has not been obtained in a lab grade, a test associated with the lab work will be scheduled (20% of the grade).

6. Sustainable Development Goals

4 - Quality Education