

30107 - Physics II

Syllabus Information

Academic year: 2024/25

Subject: 30107 - Physics II

Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia

179 - Centro Universitario de la Defensa - Zaragoza

Degree: 425 - Bachelor's Degree in Industrial Organisational Engineering

563 - Bachelor's Degree in Industrial Organisational Engineering

ECTS: 6.0

Year: 1

Semester: Second semester

Subject type: Basic Education

Module:

1. General information

COMPANY PROFILE

The subject and its expected results respond to the following approach: Analyze and autonomously solve problems that integrate different aspects of physics, recognizing the various physical and technical fundamentals underlying the problem.

The development of this subject requires knowledge of:

- Physics: understanding the fundamental equations and laws of classical mechanics.
- Mathematics: mastery of the basic notions of calculus.

In summary, we recommend a level of second year of Bachillerato in both mathematics and physics to take the course. As well as having studied and passed Mathematics I and being enrolled or having passed Mathematics II.

DEFENSE PROFILE

The curriculum is in the process of being phased out. The content of this teaching guide is the same as that of the 2023-2024 academic year. It can be consulted on this same website by selecting the aforementioned academic year at the top.

2. Learning results

1. Know the fundamental concepts and laws of mechanics, thermodynamics, fields, waves and electromagnetism and their application to basic engineering problems.
2. Analyze problems that integrate different aspects of physics, recognizing the various physical fundamentals underlying a technical application, device, or real system
3. Know the units, orders of magnitude of defined physical quantities and solves basic engineering problems, expressing the numerical result in the appropriate physical units.
4. 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.
5. Use bibliography, by any of the means currently available, and use clear and precise language in their explanations of physics questions.
6. Correctly apply the fundamental equations of electromagnetism and waves to various fields of physics and engineering.
7. 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
8. 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
9. 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
10. 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

COMPANY PROFILE

The program of the subject comprises 6 topics:

- I Electrostatics

- II Dielectric capacity and electric current
- III Magnetism
- IV Electromagnetic field
- V Wave motion
- VI Optics

4. Academic activities

COMPANY PROFILE

The subject consists of 6 ECTS credits, which represents 150 hours of student work in the subject during the semester. 40% of this work (60 h.) will be done in the classroom, and the rest will be autonomous.

The program offered to the student includes the following activities:

- Theoretical classes: Theoretical activities taught in a fundamentally expository way by the teacher.
- Practical classes: Practical discussion activities and exercises carried out in the classroom that require a high level of student participation. The practical classes may also involve the realization of experimental practices including the use of different instruments and appropriate software.
- Group and individual tutoring. They will be scheduled according to the needs of the subject.

5. Assessment system

COMPANY PROFILE

The student must demonstrate that they have achieved the expected learning results by means of the following assessment activities. There is the possibility of passing the subject by two different ways:

Continuous Assessment:

To be eligible for the Continuous Assessment system, at least 80% of the classes must be attended. It will consist of two written tests. To pass this part, a grade of 4.0 or higher on each written test is required.

The final grade for the subject will be the average of both tests.

In order to pass the subject, the student must obtain an average grade of 5.0 or higher.

Global Assessment:

The Global Assessment will consist of a final written test whose grade must be greater than or equal to 5.0 to pass the subject.

The final grade for the subject will be the grade obtained in the final written test.

The same assessment procedure will be followed in the two global assessment calls.

Note: in case the student does not pass the subject through Continuous Assessment, they will be able to do it through Global Assessment. In addition, in case the student has passed the subject through Continuous Assessment and wants to improve their grade, they can take the 1st call of the Global Assessment without the risk of lowering their grade.

6. Sustainable Development Goals

- 5 - Gender Equality
- 7 - Affordable and Clean Energy