Universidad Zaragoza

Academic Year/course: 2023/24

26801 - Physics

Syllabus Information

Academic year: 2023/24
Subject: 26801 - Physics
Faculty / School: 100 - Facultad de Ciencias
Degree: 297 - Degree in Optics and Optometry
ECTS: 9.0
Year: 1
Semester: Annual
Subject type: Basic Education
Module:

1. General information

This subject is annual and scheduled in the First Year. It is a basic training subject for both the Science and Health Science branches, and it enables students to articulate, synthesize, analyze, relate, and apply the basic principles and foundations of fluid behavior and surface phenomena, wave phenomena based on oscillations and mechanical waves, and electric and magnetic fields up to the electromagnetic field and electromagnetic waves. It also allows students to handle basic laboratory materials and techniques with ease and precision.

While this subject does not directly provide students with skills to contribute to the achievement of the 2030 Agenda, it is essential for establishing the subsequent knowledge of the rest of the degree program that is more directly related to the SDGs and therefore the 2030 Agenda.

2. Learning results

To pass this subject, the student must demonstrate the following results:

1. State, synthesize, analyze, relate, and apply the basic principles and foundations of Physics: Mechanics, Elasticity, Fluids, Waves, Electricity, and Magnetism.
2. Solve physical problems by applying models and interpret the results obtained quantitatively and qualitatively.
3. Express methods, results obtained, and analysis of the same in the proposed cases for study appropriately in terms of content and form, using scientific notation, units, and orders of magnitude.
4. Make appropriate use of basic laboratory instrumentation in Physics.
5. Prepare laboratory reports with appropriate treatment of experimental data.

3. Syllabus

1. PHYSICAL QUANTITIES AND THEIR MEASUREMENT.
2. VECTOR CALCULUS.
3. MECHANICS.
4. ELASTICITY.
5. THERMAL PROPERTIES OF MATTER.
6. FLUIDS.
7. SIMPLE HARMONIC MOTION.
8. WAVE MOTION.
9. ELECTROSTATIC FIELD.

4. Academic activities

1. Theoretical and practical problem-solving sessions in the classroom (7 ECTS)

At the beginning of each topic, students are provided with a collection of exercises, of which approximately half are solved in the classroom, with the remaining exercises assigned as non-face-to-face work for the students. Students are required to solve the proposed exercises on the board.

The distribution of credits between theoretical classes and problem-solving sessions is approximately 70%-30%.

2. Laboratory practices (2 ECTS)

Ten laboratory sessions of 2 hours each will be carried out.

5. Assessment system

All students taking the subject must:

1. Pass a partial exam each semester. The average grade of the semester exams will count for 80% of the final grade and must be passed independently of the rest of the activities.

The exams will consist of two parts: a problem-solving exercise and a theory exercise. The final grade will be the average of these two exercises, and both grades must be greater than or equal to 3 (out of 10) in order to pass.

The following partial exams will be held:

January: first semester exam

June and July: first and second semester exams

- The two midterm exams will be graded independently.

- With a grade of 5 or higher, the midterm exam will be considered passed.

- To pass the subject, both partial exams must be passed. If the grade is between 4.5 and 5 in one of the midterm exams, it can be compensated with the grade of the other partial exam.

2. Complete ten laboratory practices according to the schedule proposed at the beginning of each term. Prepare a report for each of the ten laboratory practices completed. The average grade of the practices will count for 20% of the final grade. The laboratory practices must be passed independently of the rest of the activities.

To pass the practices by continuous evaluation, it is mandatory to complete ALL ten laboratory practices and present the corresponding reports, obtaining an average grade of 5 among all the practices.

Students who have passed the laboratory practices by continuous evaluation in previous years will keep the grade obtained.

If the continuous evaluation of the practices is not passed, a practical exam must be taken. To take this exam, it is necessary to have passed the theoretical part of the subject.

3. Additional points will be awarded for solving and defending on the board some of the proposed problems. Each additional point will add 0.1 points to the final grade.

In case of failing any part (midterm exams or practices), the final grade cannot be greater than 4.