

30700 - Physics

Syllabus Information

Academic year: 2024/25

Subject: 30700 - Physics

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 470 - Bachelor's Degree in Architecture Studies

ECTS: 6.0

Year: 1

Semester: First semester

Subject type: Basic Education

Module:

1. General information

Physics 1 is part of the basic training block of the Degree in Architecture Studies. It consists of 6 ECTS, is mandatory and is taught in the first four-month period of the first year.

Together with Physics 2, it corresponds to an introductory subject in physics that, in addition to providing a basic knowledge of the fundamental laws, should serve as a foundation for higher technical subjects. It begins with a review of the dynamics of a particle. Fundamentals of system dynamics of particle and rigid solid systems are introduced. The study of rigid solids at equilibrium and mass geometry is a fundamental aspect. Finally, basic concepts about the elastic behavior of solids and fluid physics are introduced.

2. Learning results

The student, in order to pass this subject, must demonstrate the following results.

1. Analyze problems that integrate different aspects of physics, recognizing the various physics fundamentals of a technical application.
2. Know the units, orders of magnitude of the defined physical quantities and solves basic problems, expressing the numerical result in the appropriate physical units.
3. Correctly use basic methods of experimental measurement and presents and interprets the data obtained, relating them to the appropriate physical magnitudes and laws.
4. Use bibliography and uses clear and precise language in their explanations of physics issues.
5. Know the principles of general mechanics, statics and mass geometry.
6. Know the concepts of stability and equilibrium in architecture.
7. Know the principles of fluid mechanics and hydraulics.

3. Syllabus

1. Physical quantities. Dimensions. Measurements and errors.
2. Mechanics of a particle: Newton's Laws. Moment of a force. Force diagrams. Linear momentum and angular momentum. Work and energy. Conservation laws.
3. Oscillatory motion: Simple harmonic motion. Damped free oscillations. Damped forced oscillations and resonance.
4. Mechanics of particle systems: Center of masses. Momentum linear of a system. Motion of a particle system
5. Rigid solid: Moment of inertia. Steiner's theorem. Equation of motion of a rigid solid. Statics of a rigid solid. Internal stresses in structures.
6. Introduction to the theory of elasticity.
7. Introduction to fluid mechanics.

4. Academic activities

Theory classes and problems the lectures will be complemented with problem sessions, in which the emphasis will be on the applications of the concepts. Participation will be encouraged through active consultation and some problems will be proposed for students to solve on the board.

Laboratory practicals the student will be provided with the scripts, as well as a guide on the correct presentation of the results. The program of practices is designed in synchrony with the development of the theory.

Works a previously authorized topic and with tutoring. It must be submitted in writing prior to the oral presentation.

Tutorials

5. Assessment system

Assessment activities:

1. Several partial tests may be taken, based on multiple-choice/short questions or problems.
2. A work will be proposed to be carried out in group under the supervision of the teacher. The written material and its oral presentation will be graded.
3. Continuous evaluation of the laboratory.
4. In the official exam period there will be a written test with a part of problems and another part of theory and questions. Additionally, will have a part of laboratory practices for those who do not pass the continuous assessment.

The final grade for the subject:

- a) Written tests: they will account for at least 75% of the grade.

If the student chooses not to do supervised work, the weight of this part will be 85% will be 85%.

- i. Examination of problems: 65 % of the grade for this section.
- ii. Theory exam and questions: 35 % of the grade of this section.

Those who have passed the partial exams mentioned in point 1 above may choose not to take the corresponding part of the final exam, keeping the grade obtained.

- b) Supervised work. Optional: 10% of the final grade.

c) Laboratory: the grade is 15% of the final grade. The student may pass all the practices by continuous assessment throughout the subject, or by means of a final practice exam if they fail one or more.

In order to pass, the following will be required:

- A minimum grade: 4 in section a) and 5 in each laboratory practice (or final exam) (or final exam of the same).

6. Sustainable Development Goals

4 - Quality Education