

27102 - Physics

Syllabus Information

Academic year: 2024/25

Subject: 27102 - Physics

Faculty / School: 100 - Facultad de Ciencias

Degree: 446 - Degree in Biotechnology

ECTS: 9.0

Year: 1

Semester: Annual

Subject type: Basic Education

Module:

1. General information

The main objective of the subject is to provide the student with a basic training in general aspects of Physics, with special emphasis on introductory, specific and instrumental aspects useful for the study of Biology, Biochemistry and Biotechnology, as well as to level the knowledge of students from different backgrounds.

2. Learning results

- Solve theoretical and practical questions related to the knowledge taught. Know the basic laws of physics and be able to apply them to biological systems.
- Describe in physical terms the properties of bodily fluids: viscosity, turbulence, flow velocity and drag forces.
- Derive some macroscopic properties of gaseous systems from microscopic behaviour.
- Correctly apply the principles of thermodynamics to biological phenomena.
- Understand the mechanisms of thermal regulation
- Analyse the effects of electrostatic fields on different material media
- Calculate the effects of magnetic fields on charges and currents, as well as on different types of materials.
- Analyse the propagation of electromagnetic waves in general, and of light in particular, in different material media and be able to analyse interference and diffraction phenomena.
- Understand the basic principles of operation and applications of a colorimeter, spectrophotometer, mass spectrometer, magnetic resonance imaging, etc.
- Describe the main effects of radiation at cellular and organism level, apply the magnitudes used for its measurement and know basic radiation protection measures

3. Syllabus

- Dynamics. Newton's Laws
- Energy and work. Conservation theorems.
- Friction and drag forces. Elasticity.
- Fluid statics. Ideal fluid dynamics. Real fluids.
- Statistical mechanics. Kinetic theory of gases.
- Thermal equilibrium and temperature.
- Internal energy. Heat and work. First principle.
- Entropy and second principle.
- Electrostatic field and potential.
- Dielectrics and conductors.
- Stationary electric current.
- Electrical and magnetic properties of matter.
- Electromagnetic waves.
- Light propagation. Reflection and refraction.
- Interference and diffraction phenomena.
- Optical image formation. The eye.
- The atom and the atomic nucleus. Radioactivity.
- Biological effects of radiation.

4. Academic activities

Training Activity 1: Acquisition of basic knowledge of Physics (60 hours).

Participative master classes in large groups (30 hours).

Tutorials (small groups and/or individualized).

Training Activity 2: Problem solving and case study analysis in small groups in the laboratory and/or classroom (30 hours).

Problem-based learning (24 hours).

Work in the practice laboratory (6 hours).

Training Activity 3: individual work

Preparation of work and practices reports according to the model proposed by the teacher (20 hours)

Individual study (95 hours)

Learning activity 4: assessment tests (20 hours)

5. Assessment system

- Evaluation of knowledge in theoretical-practical tests throughout the term (70% of the final grade), which will eliminate subject. A minimum grade of 4 will be required for each test to be considered passed. Students must achieve a grade higher than 4 within each test, both in the theoretical and practical parts. The minimum number of tests is two, one at the end of each semester. In the case of not having passed any of the tests, or of wanting to improve the grade, students are entitled to a final exam.
- Assessment of the student's learning through problem solving case studies proposed by the teacher and laboratory work (30% of the final grade). A minimum grade of 4 will be required in this part of the evaluation.

To pass the subject, the average of the grades of the different evaluation activities, weighted as indicated above, must be greater than or equal to 5.

In addition to the assessment system indicated in the previous items, the student will have the possibility of being assessed by a global test, which will judge the achievement of the learning results indicated above.

6. Sustainable Development Goals

4 - Quality Education

5 - Gender Equality

9 - Industry, Innovation and Infrastructure