

29701 - Physics I

Syllabus Information

Academic Year: 2022/23

Subject: 29701 - Physics I

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 434 - Bachelor's Degree in Mechanical Engineering

ECTS: 6.0

Year: 1

Semester: First semester o Second semester

Subject Type: Basic Education

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. It is based on participation and the active role of the student favours the development of communication and decision-making skills. A wide range of teaching and learning tasks are implemented, such as lectures, assignments, computer lab sessions, autonomous work, and tutorials.

Students are expected to participate actively in the class throughout the semester.

Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials, including a discussion forum.

Further information regarding the course will be provided on the first day of class.

4.2. Learning tasks

The course includes 6 ECTS organized according to:

- Lectures (2 ECTS): 50 hours.
- Laboratory sessions (0.4 ECTS): 10 hours.
- Guided assignments (0.32 ECTS): 8 hours.
- Autonomous work (3.08 ECTS): 77 hours.
- Assessment (0.2 ECTS): 5 hours.
- Tutorials

Lectures: the professor will explain the theoretical contents of the course and solve illustrative applied problems. These problems and exercises can be found in the problem set provided at the beginning of the semester. Lectures run for 3 weekly hours. Although it is not a mandatory activity, regular attendance is highly recommended.

Laboratory sessions: sessions will take place every 2 weeks (5 sessions in total) and the last 2.0 hours each. Students will work together in groups actively doing tasks such as practical demonstrations, measurements, calculations, and the use of graphical and analytical methods.

Guided assignments: students will complete assignments, problems and exercises related to concepts seen in laboratory sessions and lectures.

Autonomous work: students are expected to spend about 77 hours to study theory, solve problems and prepare lab sessions.

Assessment: The final exam will be planned at the end of the semester, but also the continuous assessment will constitute a learning tool for formative and summative alternative assessment during the semester. In this way, students can check their learning outcomes during the progress of the course.

Tutorials: the professor's office hours will be posted on the degree website to assist students with questions and doubts. It is beneficial for the student to come with clear and specific questions.

4.3. Syllabus

The course will address the following topics:

MECHANICS

Principles of mechanics

1. Kinematics.
2. Dynamics.
3. Rigid body dynamics.
4. Statics.

Applied mechanics

5. Oscillatory motion.
6. Elasticity.
7. Fluid dynamics.

THERMODYNAMICS

8. Heat and temperature. Heat transfer.
9. Thermodynamics processes. The first law of thermodynamics.
10. Thermal machines. The second law of thermodynamics.

4.4. Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the EINA's website (<http://eina.unizar.es>).

4.5. Bibliography and recommended resources

Tipler, Paul A.. Física para la ciencia y la tecnología. Vol. 1, Mecánica , oscilaciones y ondas, termodinámica / Paul A. Tipler, Gene Mosca ; [coordinador y traductor José Casas-Vázquez ; traductores Albert Bramon Planas ... et al.]. 6ª ed. Barcelona : Reverté, D.L. 2010

Young, Hugh D.. Física universitaria con física moderna / Hugh D. Young, Roger A. Freedman ; con la contribución de A. Lewis Ford ; traducción, Ana Elizabeth García Hernández. 1ª ed. Ciudad de México : Pearson Educación de México, 2018