Universidad Zaragoza

Academic Year/course: 2021/22

30002 - Physics I

Syllabus Information

Academic Year: 2021/22
Subject: 30002 - Física I
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 436 - Bachelor's Degree in Industrial Engineering Technology
ECTS: 6.0
Year: 1
Semester: First semester o Second semester
Subject Type: Basic Education
Module:

1. General information

1.3. Recommendations to take this course

Given that all activities will be held in Spanish, **actual** fluency (that is, CEFR B2 level or higher) in Spanish language is an essential requirement to take this course. It is also recommended that international exchange students consult with their academic advisors before enrollment.

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 achievement of the learning objectives. It is based on participation and the active role of the student favors the development of communication and decision-making skills. A wide range of teaching and learning tasks are implemented, such as lectures, guided assignments, laboratory sessions, private/personal study, 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.

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

4.2. Learning tasks

The course includes 6.0 ECTS organized according to:

- Lectures (1.44 ECTS): 36 hours.
- Problem-solving sessions (0.56 ECTS): 14 hours.
- Laboratory sessions (0.4 ECTS): 10 hours.
- Guided assignments (0.6 ECTS): 15 hours.
- Private/personal study (3 ECTS): 75 hours.

Notes:

Lectures: the professor will explain the theoretical contents of the course and solve illustrative applied examples. Lectures run for 3 weekly hours. Although it is not a mandatory activity, regular attendance is highly recommended.

Problem-solving sessions: guided, tutor-led problem-solving in a small group.A full set of problems and exercises will be provided at the beginning of the semester.

Laboratory sessions: sessions will take place every 2 weeks (4+1 sessions) and last 2 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.

Private/personal study: students are expected to spend about 75 hours to study theory, solve problems, prepare lab sessions, and take exams.

Tutorial: a meeting involving one-to-one or small group supervision, feedback or detailed discussion on a particular topic. The professor's office hours will be posted on Moodle.

4.3. Syllabus

The course will address the following topics:

Theory sessions

Topic 1. Motion in one, two and three dimensions (4 hours)

Topic 2. Newton?s laws of motion: single particle (4.5 hours)

Topic 3. Newton?s laws of motion: several particles (5.5 hours)

Topic 4. Rotation of rigid bodies (8 hours)

Topic 5. Periodic motion (4.5 hours)

Topic 6. Elasticity (1 hours)

Topic 7. Fluid mechanics (3.5 hours)

Topic 8. Temperature and heat (1 hour)

Topic 9. The first law of thermodynamics (3 hours)

Topic 10. The second law of thermodynamics (1 hour)

Laboratory sessions

Session 1. Newton?s 2nd law of motion

Session 2. Archimedes? principle and Stokes? law

Session 3. Periodic motion: Pohl?s pendulum

Session 4. Determination of the ratio of heat capacities for an ideal gas: Flammersfeld?s oscillator

Examination session.

4.4. Course planning and calendar

For further details concerning the timetable, classroom and further information regarding this course, please refer to the Escuela de Ingeniería y Arquitectura de la Universidad de Zaragoza (EINA), website, https://eina.unizar.es/.

4.5. Bibliography and recommended resources

Link:
http://biblos.unizar.es/br/br_citas.php?codigo=30002&year=2020