Universidad Zaragoza

Year : 2019/20

25869 - Physics II

Syllabus Information

Academic Year: 2019/20
Subject: 25869 - Physics II
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 558 - Bachelor's Degree in Industrial Design and Product Development Engineering
ECTS: 6.0
Year: 1
Semester: Second semester
Subject Type: Basic Education
Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

BASIC COMPETENCES

CB01. Students have demonstrated knowledge and understanding in a field of study that is part of the general secondary education curricular, and is typically at a level which, although it is supported by advanced textbooks, includes some aspects that involve knowledge of the forefront of their field of study.

CB02. Students can apply their knowledge to their work or vocation in a professional manner and have competences typically demonstrated through devising and defending arguments and solving problems within their field of study.

CB03. Students have the ability to gather and interpret relevant data (usually within their field of study) to inform judgments that include an important reflection on social, scientific or ethical issues.

CB04. Students can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences.

CB05. Students have developed those skills needed to undertake further studies with a high degree of autonomy.

GENERAL COMPETENCES

GC04. Ability to organize time effectively and coordinate activities to acquire new knowledge quickly and perform under pressure.

GC05. Capacity to collect, manage, analyze and synthesize information from various sources for the development of design projects and product development. Capacity to use this documentation to obtain conclusions aimed at solving problems and making decisions with initiative, creativity and critical thinking, in order to generate new product concepts, new ideas and solutions.

GC06. Ability to generate the necessary documentation for the proper transmission of ideas through graphics, reports and technical documents, models and prototypes, oral presentations in Spanish and other languages.

GC07. Ability to use and master techniques, skills, tools and techniques and communication and others specific of design engineering needed for design practice.

GC08. Ability to learn continuously, to develop autonomous learning strategies and to work in multidisciplinary groups with motivation and determination to achieve goals.

SPECIFIC COMPETENCES

SC02. Understanding and mastery of basic concepts of the general laws of mechanics, thermodynamics, fields and waves and electromagnetism and its application for solving problems of Engineering in Industrial Design and Product Development.

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

Subject's learning process to pass the subject is based on the following aspects:

1. Lectures, where the lecturer will explain the main theoretical concepts as well as, will illustrate the application of the theoretical material via exercises and practical cases. Active students' participation is intended in this activity. In parallel, the students should spend self-study time in order to take advantage of the lectures.
2. Laboratory sessions will be scheduled during the semester. Lab sessions' assessment will contribute to the single overall mark. Lab sessions' groups will consist of two or three members.
3. Supervised projects where students will work on problem-solving tasks or a practical question proposed by the professor and related with the concepts learned in the subject.
4. Self-study time, learning the subject as well as performing problem solving tasks. This activity is essential for the student's learning process as well as to have success to pass the subject.

4.2.Learning tasks

The course includes the following learning tasks:

- **Lectures T1** (43 hours) (classroom activity). This activity is intended to present the basics of the discipline illustrated with practical examples in order to facilitate the understanding and assimilation of the concepts. Problem-solving tasks and illustrative examples will take place in the practical sessions with the cooperation of students. Students will be encouraged to solve prior to the masterclasses some problems proposed by the professor. This activity will take place on-site in the classical classroom.
- **Laboratory sessions T3** (10 hours) (classroom activity). Laboratory sessions' scripts will be available for the students in the ADD. Scripts consist of a theoretical introduction and the steps to perform during the lab activity. Reading the script prior to attent to the laboratory session is a must for the student. Writing a full report including the main result is recommended after completing the lab sessions.
- **Supervised projects T6** (8 hours) (non-classroom activity). This task could be:
    - 1) Writing of the lab sessions' reports.
    - 2) The professor will propose topics for individual or team works about different subject's parts. Students will be tutored during these tasks.
- **Autonomous work T7** (84 hours) (non-classroom activity). It is of importance for the student to devote constant efforts, during the semester, for personal study, problem-solving tasks and writing lab sessions' reports.
- **Assessment T8** (5 hours) (classroom activity). The overall assessment is planned at the end of the semester, but the continuous assessment will be a learning tool for formative and summative assessment during the semester. In this way, students can check their learning during the progress of the course.
- **Tutorials.** The professor's tutoring timetable will be available for the student to ask a question about the subject.

4.3.Syllabus

The course will address the following learning tasks:

ELECTROMAGNETISM

- 1. Electrostatic field.
- 2. Electrical current.
- 3. Static magnetic field.
- 4. Electromagnetic induction. Maxwell's equations.

WAVES

- 5. Waves in solids and fluids. Acoustics.
- 6. Electromagnetic waves.
- 7. Optics.

4.4.Course planning and calendar

The schedule for the lectures, problem-solving sessions, and laboratory sessions will be planned by the university center and will be published on the center's website. The remainder activities will be planned depending on the number of students and the schedule will be provided in advance.

4.5.Bibliography and recommended resources