30705 - Physics 2

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	470 - Bachelor's Degree in Architecture Studies
ECTS	6.0
Year	1
Semester	Second semester
Subject Type	Basic Education
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

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

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The learning process that is designed for this subject is based on the following:

. Theory classes will focus on the explanation of the physical principles as well as on the resolution of selected problems.

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Throughout the semester assessment tests will be conducted in order to check the understanding of the topics under study.

-Scheduled problem classes. In general, each problem class will cover topics belonging to one module. (See the program)

-Laboratory sessions, in which the students must carry out simple physics experiments, under the teacher supervision, and the support of a guide. Students must prepare a lab report for each experiment including their experimental results as well as data analysis and a brief discussion

- Throughout the semester students may be asked to prepare some academic works to be submitted in writing and oral to the teacher.

5.2.Learning tasks

The scheduled activities to achieve the expected learning results are:

Theory and problem classes

At the beginning of the lecture the teacher will make a brief presentation of the subject, referring it to a more general context and highlighting the relationships with other items. Applications of the studied concepts will be emphasizes throughout each session giving general guidelines for problem solving. During problem classes the increase of the participation of students is pursued. The students are encouraged to solve some selected problems and explain them to the class group. Besides, dialogue will be promoted so that the questions/answers of the students should allow the teacher to perceive the learning progress of the group.

Laboratory sessions

The group is divided in several laboratory subgroups -of about 14-16- students that are organized in pairs to carry out the lab work.

The laboratory program is designed according to the scheduled classes of theory. The student will have a detailed script of the practical works to perform as well as guidance on the proper presentation of the results.

Academic work and oral presentations

Students can autonomously perform an academic work (of appropriate level for 1st year students) previously authorized

by the teacher and under his supervision. The work must be submitted in writing, in advance of the compulsory oral presentation.

Tutorial support

Tutorial support is offered to the students, who can book an appointment with the teacher to solve any question concerning the program items.

5.3.Syllabus

I. Electric Fields and Currents

A. Electric Field and Electric Potential

1. Coulomb's Law.
2. Electric Flux and Gauss's Theorem.
3. Electric Potential.
4. Conductors and Dielectric Materials. Capacitors.

B. Direct Currents.

1. Ohm's Laws.
2. Joule Effect and Energy Dissipation.

II. Thermodynamics and Calorimetry

A. Heat and Temperature

1. Temperature. Thermal Expansion. Thermal Stress.
2. Specific Heat and Thermal Capacity.
3. Mechanisms of Heat Transmission. Fourier's Equation.

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B. Thermodynamics and Thermal Machines.

1. Work and Heat in Thermodynamics.
2. The First Law of Thermodynamics: Thermodynamic Processes.
3. The Second Law of Thermodynamics: Thermodynamic Cycles. Thermal Engines.

III. Oscillatory Motion and Waves.

1. Nature of the Waves.
2. Waves Superposition Principle
3. Sound Waves. Intensity of Sound. Tone and Timbre.
4. Reverberation. Sound Absorption. Sound Insulation.

IV. Light and Colour

1. The Nature of Light. Electromagnetic Waves.
2. Reflection and Refraction.
3. Geometric Optics.
4. Light Polarization. Interference
5. Fotometry and Colourimetry.

5.4.Course planning and calendar

Lectures (3 or 4 hours a week, on alternate weeks) and laboratory sessions (2 hours a week on alternate weeks for each subgroup) are taught according to the schedule established, published well in advance to the beginning of the term.

The laboratory reports have to be delivered at the end of the corresponding experimental class.

Appointments for oral presentation of academic works will be set up with the students

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5.5.Bibliography and recommended resources

Bibliography

Main Reference Text

- Sears - Zemansky -Young - Freedman, *University Physics* , Vol.2, Ed. Pearson Addison Wesley, 13 th Ed.

Alternative Choices

- P. Tipler, G. Mosca, *Physics for Scientists and Engineers* , Vol. 2 (Mechanics, Oscillations and Waves, Thermodynamics) 6 th Ed.
- R. A. Serway, J. W. Jewett, *Physics* , Vol. 2, (Mechanics, Oscillations and Waves, Thermodynamics), Ed. Thomson, 7 th Ed.

Complementary Bibliography for Specific Aspects of the Course:

- A.P. French, *Oscillations and Waves,*