230081 - FDF - Fundamentals of Physics

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
Teaching unit: 748 - FIS - Department of Physics
Academic year: 2017
Degree: BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Teaching unit Compulsory)
ECTS credits: 5
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: Benadero Garcia-Morato, Luis
Others: Benadero Garcia-Morato, Luis
Alonso Maleta, Maria Aranzazu
Gomis Arbones, Vicente
Juan Zornoza, Jose Miguel
Garcia Garcia, Jose Eduardo

Degree competences to which the subject contributes

General:
12 CPE N1. They will be able to identify, formulate and solve engineering problems in the ICC field and will know how to develop a method for analysing and solving problems that is systematic, critical and creative.

Learning objectives of the subject

The course aims primarily to prepare students for the understanding of fields, oscillations and waves. It also aims to harmonize the level of knowledge of students and simultaneously introduce a more mathematical language to describe the physical phenomena. It is expected that students learn to consider the difficulties that entails additional experimental work.

Learning outcomes:

Understand and master the basics of the general laws of mechanics, thermodynamics and waves.
Apply basic physical principles to solve problems in engineering

Study load

| Total learning time: 125h | Hours large group: | 52h | 41.60% |
| Self study: | 73h | 58.40% |
**Unit 1. Introduction to Mechanics**

**Description:**
It aims to see again kinematics and dynamic mathematical incorporating new elements: assume that we have any movement, we need a reference that can move from one reference to another, we introduce the analysis of movement in three dimensions, the analysis compared inertial reference systems, and how to confront a mechanical problem. To strengthen the basic concepts of function, derivative and integral, as well as the manipulation of vectors. Prior to the study of the oscillator and waves.

**Learning time:** 10h  
Theory classes: 10h

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**Unit 3. Work and Energy**

**Description:**
Introduced the concepts of energy and other conservative figures. It is defined as working full line in a field of forces and potential energy is defined in a conservative field. Basic to understanding the behavior of electrostatic fields and electric potential.

**Learning time:** 10h  
Theory classes: 10h

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**Unit 3. Heat and Temperature**

**Description:**
content english

**Learning time:** 8h  
Theory classes: 8h

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**Unit 4. Mechanical Oscillations**

**Description:**
Introduced physical systems in which a force depends on the position and speed, allowing, by analogy, introduce us to the study of linear electrical circuits. The need to introduce linear differential equations of first and second order. And study the relaxation oscillations in both transient and permanent. introducing tools for the treatment of harmonic signals.

**Learning time:** 10h  
Theory classes: 10h
Unit 5. Waves

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<th>Learning time: 10h</th>
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Description:
We study the basic behavior of the waves, thanks to the introduction of the concept of partial derivative. This study focuses on the transverse waves on a string and the longitudinal waves in a gas. Behavioral studies include universal wave like interference, stationary waves and reflected waves. This study is the basis for understanding the electromagnetic waves.

Qualification system

1) Assessment procedure: The top note of the following two options:
- a.- 40% course mark + 60% final exam
- b.- 100% final exam
2) Re-evaluation procedure: If the subject was failed and the qualification was not "Absent", there is a chance of a second test during the first two weeks of July. Qualification higher than 3 is required and for a not more than two subjects in the case of students enrolled in September.

Bibliography

Basic:


Complementary:
