Physics I

Academic Year: (2019 / 2020) **Review date: 23-04-2020**

Department assigned to the subject: Physics Department

Coordinating teacher: MUÑOZ CASTELLANOS, ANGEL

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 1

Branch of knowledge: Engineering and Architecture

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Initiation to the differential and integral calculus and also vector calculus. Furthernore, good knowledge in trigonometry.
It is recommended to take the zero course in physics offered by our university to new students in all engineering degrees.

OBJECTIVES

By the end of this subject, students will be able to have:
1. Have knowledge and understanding of the physical principles of mechanics and thermodynamics
2. Have the ability to apply their knowledge and understanding in order to identify, formulate and solve problems of mechanics and thermodynamics using established methods
3. Have the ability to design and perform mechanical and thermodynamic experiments, in order to interpret the data obtained and draw conclusions from them.
4. Have laboratory equipment management skills for data collection in mechanics and thermodynamics practices
5. Have the ability to select and use appropriate tools and methods to solve problems of mechanics and thermodynamics
6. Have the ability to combine theory and practice to solve problems of mechanics and thermodynamics

DESCRIPTION OF CONTENTS: PROGRAMME

01. Kinematics of a particle
02. Dynamics of a particle
03. Conservative and nonconservative forces
04. Particle systems
05. Kinematics of rigid bodies
06. Dynamics of rigid bodies
07. Introduction to Thermodynamics. Temperature
08. First law
09. Second law
10. Entropy

LEARNING ACTIVITIES AND METHODOLOGY

Lectures on theory, student presentations and personal work; aimed at the acquisition of theoretical knowledge (3 ECTS).
Laboratory practical sessions of compulsory attendance, problem-solving sessions in small groups with direct and active interaction between students and teacher, tutorials and personal work, aimed at the acquisition of practical skills related to the program of the course (3 credits ECTS .)

ASSESSMENT SYSTEM

Throughout the course there will be continuous assessment tests. These tests will consist of several exams. They will allow to evaluate the degree of understanding of the different theoretical concepts explained in the lectures. The result of this evaluation will be the 25% of the final grade.

Laboratory practical sessions of the course will be structured in 4 sessions of 1.5 hours. Assistance and preparation of reports for each of the practices is compulsory. The laboratory final grade will be evaluated on the following two aspects of each of the practical sessiones:
a) Student participation. It will be checked by questions made to the students by the teacher after the

delivery of each report.
b) Correction of the report prepared for each practical session.

The lab grade will be 15% of the final grade.

It is compulsory to deliver the lab reports in order to pass the course.

There will be a final exam, which may consist of theretical and practical (probloem solving) questions. Its score will represent 60% of the final grade. In order to pass the course, a minimum grade of 3 (out of 10) must be obtained in the final exam.

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

BASIC BIBLIOGRAPHY

- Alonso-Finn Física, Ed. Addison-Wesley Iberoamericana, 1995
- Beer, Jonston y Cornwell Mecánica Vectorial para Ingenieros. Volumenes Estática y Dinámica., Mc Graw Hill..
- Ohanian, H.C., Markert, J.T. Física para ingeniería y ciencias, McGraw-Hill, 2009
- Tipler, P. A. Física para la ciencia y la tecnología., Ed Reverté , 2005

ADDITIONAL BIBLIOGRAPHY

- Burbano de Ercilla S., Burbano García E. Problemas de Física, Tebar, 2004
- Hewitt, P.G. Física Conceptual, Pearson-Addison Wesley, 2004
- Y. Çengel, M. Boles Termodinámica, Mc Graw Hill, 2006.