

## Physics I

Academic Year: ( 2024 / 2025 )

Review date: 04-04-2024

Department assigned to the subject: Physics Department

Coordinating teacher: CRUZ FERNANDEZ, ROSA MARIA DE LA

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)

The students should know Elemental Physics at level of High School.

## SKILLS AND LEARNING OUTCOMES

CB1. Students have demonstrated possession and understanding of knowledge in an area of study that builds on the foundation of general secondary education, and is usually at a level that, while relying on advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study.

CB2. Students are able to apply their knowledge to their work or vocation in a professional manner and possess the competences usually demonstrated through the development and defence of arguments and problem solving within their field of study.

COCIN3. Knowledge of basic and technological subject areas that will capacitate them to acquire new methods and theories and endow them with the versatility to adapt to new situations.

COCIN4. Ability to resolve problems with initiative, decision-making, creativity, and critical reasoning skills and to communicate and transmit knowledge, skills and abilities in the Industrial Engineering field.

CEP3. Ability to design and carry out experiments to analyze and interpret data obtained.

CEB2. Understanding and command of the fundamental concepts of the general laws of mechanics, thermodynamics, electromagnetic fields and waves and application for resolving engineering problems.

By the end of this content area, students will be able to have:

RA1.1. Knowledge and understanding of the physics principles underlying their branch of engineering.

RA2.1. The ability to apply their knowledge and understanding to identify, formulate and solve physics problems using established methods.

RA4.2. The ability to design and conduct appropriate experiments, interpret the data and draw conclusions.

RA4.3. Workshop and laboratory skills.

RA5.1. The ability to select and use appropriate tools and methods to solve physics problems.

RA5.2. The ability to combine theory and practice to solve physics problems.

## OBJECTIVES

1. Basic knowledge of the physical fundamentals related to mechanics and thermodynamics.

2. Necessary skills for the development and resolution of problems of mechanics and thermodynamics by using established methods.

3. Necessary skills to design experiments of mechanics and thermodynamics and to interpret the obtained results and draw conclusions.

4. Necessary skills for the experimental techniques and the use of measurement equipments related with the mechanics and thermodynamics.

5. Necessary skills to select and to use tools and methods to resolve problems of mechanics and thermodynamics.

6. Necessary skills to combine the theory and experiments to resolve problems of mechanics and thermodynamics.

5. Measurements and experimental analyses of magnitudes related to Mechanics and Thermodynamics.

## DESCRIPTION OF CONTENTS: PROGRAMME

1. Kinematics of a particle
2. Dynamics of a particle
3. Conservative and non-conservative forces. Work and energy
4. System of particles
5. Kinematics of rigid solid
6. Dynamics of rigid solid
7. Introduction to Thermodynamics. Temperature. Ideal gases
8. First Principle of Thermodynamics
9. Second Principle of Thermodynamics
10. Entropy

#### LEARNING ACTIVITIES AND METHODOLOGY

- Magister and practical teaching sessions. Also, it is mandatory the attendance of students to laboratory sessions.

#### ASSESSMENT SYSTEM

<b>% end-of-term-examination:</b>	60
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	40

The grade consists in 60% of the final exam and 40% of the continuum evaluation.

The attendance at laboratory sessions along with the practises delivery are mandatory in order to pass satisfactorily the subject.

The students have to obtain a remark of 3 over 10 in the final exam to make the median value of all evaluations.

#### BASIC BIBLIOGRAPHY

- P.A. Tipler Physics, Vol 1, Ed. Reverte, 2005
- Serway-Jewett Physics for Scientists and Engineers, 9th Edition, Boston (USA), 2012
- W. Bauer and G.D. Westfall University Physics with Modern Physics, , Vol 1, 2012