COURSE DATA

Data Subject	
Code	34789
Name	Physics I
Cycle	Grade
ECTS Credits	6.0
Academic year	2018 - 2019

Study (s)

Degree	Center	Acad. year	Period
1402 - Degree in Telecommunications Electronic Engineering	School of Engineering	1	First term

Subject-matter

Degree	Subject-matter	Character
1402 - Degree in Telecommunications Electronic Engineering	2 - Physics	Basic Training

Coordination

Name	Department
BORDES VILLAGRASA, JOSE MANUEL	185 - Theoretical Physics
OTEO ARACO, J. ANGEL	185 - Theoretical Physics

SUMMARY

Fisica I is a first course subject on basic physics corresponding to the first four-month term of the Degree on Telecomunications. The main part of the subject is lectured to the complete group of students at the class-room, complemented with practical sessions given at the Laboratory of General Physics for subgroups of 16 students. The main goals of the subject are:

- To master different approaches to solve different problems of Physics, including the necessary mathematical tools. Special care will be put on the interpretation of the results and criticism by the student.
- To offer good physical grounds to the students in order that she or he could face other subjects of the same or higher courses.

To introduce the experimental work in Physics to the student, including experimental setups, data taking and their mathematical treatment, as well as the correct interpretation in terms of physical laws and presentation of a scientific memorandum.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

It is highly recommended to have already followed subjects on Physics and Mathematics at high-school.

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

1402 - Degree in Telecommunications Electronic Engineering

- G3 - Acquisition of the knowledge of the basic and technological subjects that allows students to learn new methods and theories and endows them with the versatility to adapt to new situations.
- G4 - Ability to solve problems with initiative, decision-making and creativity, and to communicate and transmit knowledge, abilities and skills, understanding the ethical and professional responsibility of the activity of a telecommunications technical engineer.
- B3 - Understand and master the basic concepts of the general laws of mechanics, thermodynamics, fields and waves and electromagnetism their application to solve engineering problems.

LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

This subject should endorse the student with the following learning abilities (G3, G4, B3):

- To know and understand the basic concepts of Physics, as well as the required mathematical tools, and the main applications for industry or common life.
- Ability of estimating the orders of magnitude of physical quantities and the relative importance of the different causes yielding a physical process.
- To resolve problems, being able of identifying the essential points and to make the appropriate approximations
- To get a deeper insight into different branches of Physics starting from the basic notions obtained in this subject, including mathematical formalism and more elaborate concepts.
- Ability of conveying information, ideas, questions and solutions through argument and reasoning.

DESCRIPTION OF CONTENTS

1. Units and magnitudes

Dimensional analysis. Orders of magnitude.

2. Particle kinematics

Linear motion in two and three dimensions. Reference frames. Circular and harmonic motion.

3. Particle dynamics

Newton laws. Friction. Applications.

4. Energy and momemtum

Work and kinetic energy. Conservative forces and potential energy. Linear momentum. Conservation laws.

5. Gravitational field

Newton law. Gravitational potential energy. Intensity of the gravitational field and equipotential surfaces.

6. Fluid mechanics

Pressure. Pascal and Archimedes principles. Laminar and turbulent regime. Viscosity.

7. Thermodynamics

Energy conservation (first law), Entropy (second law).

8. Laboratory

General introduction to the laboratory and two demostrations ("Hookes law and elastic oscillations" and "Density and Viscosity").

WORKLOAD

ACTIVITY	Hours	% To be attended
Classroom practices	25,00	100
Theory classes	25,00	100
Laboratory practices	10,00	100
Development of group work	8,00	0
Study and independent work	10,00	0
Preparation of evaluation activities	12,00	0
Preparing lectures	30,00	0
Preparation of practical classes and problem	30,00	0
TOTAL	**150,00**	

TEACHING METHODOLOGY

The subject is split into two parts, with a distinct methodology in each case:

- Theory and exercises (lectures on blackboard). (G3, B3)
- Laboratory. (G3, G4, B3)

Theory and exercises:

Four hours per week are foreseen on average, equally distributed as theory and exercise lectures. Theory lectures will be generally of the masterclass type, providing the contents of the subject, but special emphasis will be made on the applications and resolution of questions and exercises, thereby stimulating students' participation.

In the practical lectures, questions and problems related to each topic will be resolved in the classroom. Previously, the professor should have provided the student with a collection of problems; some of them will be resolved during the class time. More problems will be assigned individually to each student, which should be returned by the student once the topic is over.

Laboratory: Compulsoy activity.

4 sessions of laboratory are foreseen for subgroups of 16 students each, with a professor. The first session is devoted to the treatment of experimental data (errors, graphics, fits). Subsequent sessions are dedicated to demonstrations, where students in pairs, carry out the experimental setup and data taking. Every pair of students has to provide a memo, with the data, results, graphics and fits, as well as the main conclusions. Special emphasis will be put in the use of the software required in the treatment of data (calculus sheet) which can be done using the Laboratory computers during the sessions.

EVALUATION

The evaluation of the subject will be carried out taking into account the two parts: a) theory and exercises, b) laboratory, with the following criteria:

a) Evaluation of theory and exercises. (G3, G4, B3)

Mode A

Partial exam I: chapters 1, 2, and 3.

Partial exam II: chapters 4 to 6.

Mode B

Evaluation by a single final exam.

In both cases the exam will consist of a part of theory (50% of the note of the exam) and another of exercises (50% of the note of the examination).

A mark of 3/10 in each of them is required to perform the average.

b) Evaluation of the laboratory. (G3, G4, B3)

Assistance to the laboratory classes and qualification of the individual reports.

To pass the course, it is necessary that a laboratory qualification greater than 5/10.

FINAL EVALUATION

The final evaluation of the subject (on a 10 points basis) will be made with the following criteria:

Mode A

A) **4 points:** qualification of the partial exam I.

B) **4 points:** qualification of the partial exam II.

C) **2 points:** qualification of the work carried out in the laboratory (binding activity to pass the course).

Final score: A+ B +C.

Mode B

A) 8 points: qualification of the final exam.

B) 2 points qualification of the work carried out in the laboratory (binding activity to pass the course).

Final score: A+B.

Pass mark: 5 points out of 10.

In any case, the evaluation system will be ruled by what is established in the Evaluation and Qualification Regulations of the University of Valencia for Degrees and Masters.

(https://webges.uv.es/uvTaeWeb/MuestraInformacionEdictoPublicoFrontAction.do?accion=inicio&idEdictoSeleccionado=5639).

REFERENCES

Basic

- A. Rex, R. Wolfson. Fundamentos de Física. Ed. Pearson Education, Madrid 2011.
- Tipler, Mosca, Física para la Ciencia y la tecnología, Volumen I, Reverté 2010.

Additional

- Fishbane, Gasiorowicz, Física para ciencias e ingeniería, Prentice Hall 1993
- Alonso, Finn, Física, Pearson Ecuación 2000
- Alcaraz Sendra, Física. Problemas y ejercicios resueltos. Pearson 2006