COURSE DATA

Data Subject	
Code	34789
Name	Physics I
Cycle	Grade
ECTS Credits	6.0
Academic year	2020 - 2021

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 done independently for the two parts of the subject: a) Laboratory and b) Theory and problems.

a) Laboratory evaluation (Competences G3, G4 and B3):

Assistance to the laboratory and qualification of the individual memories made. In order to pass the course it is necessary that the laboratory grade is greater than or equal to 5/10.

In the first call there is no possibility of recovering this part of the evaluation by other methods. Therefore, with the laboratory failed, you cannot choose to pass the subject in this call.

b) Assessment of theory and problems (Competences G3 and B3)

Modality: continuous evaluation.

Evaluation through partial exams of the subjects . Requirements to pass the subject: weighted average mark of the exams greater than or equal to 5.

Modality: single evaluation.

Failure to pass the subject through continuous assessment the student will have to sit for a final exam on the date set by the Center. The exam will consist of a theory part (50% of the exam grade) and a problem part (50% of the exam grade). In order to carry out the average between the two and choose to pass the course, a minimum grade of 3/10 is required in each of them.

FINAL EVALUATION (first call)

The final evaluation of the subject (out of 10 points) will be done with the following criteria:

Modality: continuous evaluation.

A) 2 points: qualification of the work done in the laboratory.

B) 8 points: grading of the partial exams.

Final grade: A + B

Modality: single evaluation.

A) 2 points: qualification of the work done in the laboratory.

B) 8 points: final exam grade.

Final grade: A + B

Pass grade: 5 points.

FINAL EVALUATION (second call)

For the qualification of the second call, a laboratory exam will be carried out for those students who have not passed it in the first call. It will be necessary to pass this exam to be able to take the theory exams.

The evaluation method will be the same as in the single evaluation modality of the first call.

"In any case, the evaluation system will be governed by the provisions of the Evaluation and Qualification Regulations of the Universitat de València for Grades and Masters (https://webges.uv.es/uvTaeWeb/MuestraInformacionEdictoPublicoFrontAction.do?accion=inicio&idEdictoSelecctado = 5639) ”Sistema d’avaluació de l’assignatura)

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

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

1. Contents
The contents initially programmed are maintained.

2. Volume of work and temporary planning of teaching
The different activities described in the Guide are maintained with the planned dedication.
The material for the monitoring of classroom theory / practical classes allows to continue with the temporary teaching planning both in days and in hours, both if the teaching is in the classroom or not.

3. Teaching methodology

In classroom theory and practical classes there will be as much attendance as possible, always respecting the sanitary restrictions that limit the capacity of the classrooms to 50% of their usual occupation. Depending on the capacity of the classroom and the number of students enrolled, it may be necessary to distribute the students into two groups. If this situation arises, each group will attend classroom theory and practical sessions with a physical presence in the classroom by rotating shifts, thus ensuring

compliance with the criteria for occupying spaces. The rotation system will be established once the actual enrollment data is known, guaranteeing, in any case, that the attendance percentage of all the students enrolled in the subject is the same. For non-classroom theory and practical sessions, there will be a preferably synchronous online teaching model, as long as compatibility with other scheduled activities allows. Online teaching will be carried out by synchronous videoconference respecting the schedule, or, if not possible, asynchronous.

With respect to laboratory practices, attendance at sessions scheduled in the schedule will be entirely in person. In particular, if a laboratory session cannot be carried out, the teacher will provide an experimental data table with which the student will make the practice report and present it in the virtual classroom. The entire process will be carried out in the period set by the teacher, always before the theoretical exam.

Once the actual enrollment data is available and the availability of spaces is known, the Academic Committee of the Degree will approve the Teaching Model of the Degree and its adaptation to each subject, establishing this model the specific teaching conditions in which the subject will be developed.

If there is a closure of the facilities for sanitary reasons affecting totally or partially the classes of the subject, these will be replaced by non-contact sessions following the established schedules.

4. Evaluation
The face-to-face assessment tests of the subject will be replaced by tests of a similar nature that will be carried out in a non-presential mode.

5.Bibliography
The bibliography recommended in the Teaching Guide is kept as it is accessible.