COURSE DATA

DATA SUBJECT

Code: 34873
Name: Physics I
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1403 - Degree in Telematics Engineering	Escola Tècnica Superior d'Enginyeria	1	First quarter
1935 - Double Degree Program in Mathematics-Telematics Engineering	Facultat de Ciències Matemàtiques	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1403 - Degree in Telematics Engineering	Physics	BASIC
1935 - Double Degree Program in Mathematics-Telematics Engineering	Primer curso	COMPULSORY

COORDINATION

BORDES VILLAGRASA JOSE MANUEL

OTEO ARACO J ANGEL

SUMMARY

(From the document: Memoria de verificación del MECD. Item 5.5.1.3)

Fisica I is a first course subject on basic physics corresponding to the first four-month term of the Degree on Telematics Engineering. 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.

I>

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 / LEARNING OUTCOMES

-

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.

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.

DESCRIPTION OF CONTENTS

0. ELEMENTS OF MATHEMATICS

Vectors. Operations with vectors. Cartesian components. Derivatives and integrals.

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

Newtons laws. Friction. Applications.

4. ENERGY AND MOMENTUM

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. Angular moment and Kepler Laws.

6. FLUID MECHANICS

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

7. TERMODYNAMICS

Temperature. Theorem of conservation of energy. Entropy. Second principle of termodynamics.

8. LABORATORY

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

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	25,00
Laboratory	10,00
Classroom practices	25,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	8,00
Independent study and work	10,00
Preparation of lessons	60,00
Preparation for assessment activities	12,00
Resolution of case studies	0,00
Total hours	**90,00**

TEACHING METHODOLOGY

(From the document: Memoria de verificación del MECD. Item 5.3)

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

• Theory and exercises (lectures on blackboard)

• Laboratory

Theory and exercises (Outcome G3 and B3).:

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. Compulsory attendance activity (Outcome G3, G4 and B3).:

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 course evaluation will be done independently for the two parts of the subject:
a) Laboratory and b) Theory and Problems

a) Laboratory evaluation (Competencies G3, G4, and B3):
Attendance at the laboratory and grading of the individual reports. To pass the course, the laboratory grade must be 5/10 or higher. In the first sitting, this part of the assessment cannot be recovered through other methods. Therefore, if the laboratory is failed, the student cannot pass the course in this sitting.

b) Theory and Problems evaluation (Competencies G3 and B3)
Method: continuous assessment.
Assessment through midterm exams on the subject topics.
Requirements for passing the course: weighted average grade of the exams 5 or higher.

Method: single assessment.
If the student does not pass the course through continuous assessment, the student will be required to take a final exam on the date set by the Center.

FINAL EVALUATION (first call)
The final assessment for the course (out of 10 points) will be based on the following criteria:

Method: continuous assessment.
A) 2 points: grade for laboratory work.
B) 8 points: grade for midterm exams.
Final grade: A + B

Method: single assessment.
A) 2 points: grade for laboratory work.
B) 8 points: grade for the final exam.
Final grade: A + B

Pass mark: 5 points.

FINAL EVALUATION (second call)
For the second call, a laboratory exam will be given to those students who did not pass it in the first call. It will be necessary to pass this exam in order to be able to take the theory exams.
The assessment method will be the same as for the single assessment method used in the first call.

Copying or plagiarism of any activity that is part of the evaluation will result in the impossibility of passing the course, and the student will then be subject to the appropriate disciplinary procedures indicated in the ACTION PROTOCOL FOR FRAUDULENT PRACTICES AT THE UNIVERSITY OF VALENCIA (ACGUV 123/2020).

In any case, the evaluation system will be governed by the provisions of the Evaluation and QualificationRegulations of the Universitat de València for Grades and Masters (https://webges.uv.es/uvTaeWeb/MuestraInformacionEdictoPublicoFrontAction.do?accion=inicio&idEdictoSelecctado = 5639)

REFERENCES

- A. Rex, R. Wolfson. Fundamentos de Física. Ed. Pearson Education, Madrid 2011.

- Fishbane, Gasiorowicz, Física para ciencias e ingeniería, Prentice Hall 1993
- Tipler, Mosca, Física para la Ciencia y la tecnología, Volumen I, Reverté 2010.
- Alonso, Finn, Física, Pearson Ecuación 2000
- Alcaraz Sendra, Física. Problemas y ejercicios resueltos. Pearson 2006