

SUBJECT TEACHING GUIDE

G275 - Physics I

First Degree in Industrial Electronic Engineering and Automatic Control Systems

Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	First Degree in Industrial Electronic Engineering and Automatic Control Systems			Type and Year	Core. Year 1
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Physics Basic Training Module				
Course unit title and code	G275 - Physics I				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Knowledge Field	Industrial engineering, mechanical engineering, automation engineering, industrial organization engineering and navigation engineering				
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. CIENCIAS DE LA TIERRA Y FISICA DE LA MATERIA CONDENSADA				
Name of lecturer	JAVIER ALONSO MASA				
E-mail	javier.alonsomasa@unican.es				
Office	Facultad de Ciencias. Planta: + 3. DESPACHO BECARIOS SOLIDO (3006)				
Other lecturers	LUIS FERNANDEZ BARQUIN				

4. OBJECTIVES
This subject is aiming at providing the student beginning to perform his/her Engineering degree with the knowledge and the understanding of the fundamental concepts, laws, and principles ruling the Mechanics.
To appreciate Physics as a way of understanding nature and to be able to judge orally the practical situations associated to the contents of the subject.
To identify the key points of a physical phenomenon and to analyse it through an experiment, bearing in mind the proposed model and the mathematical methods.
To analyse and present the obtained results taking into account the precision of the used instruments.

6. SUBJECT PROGRAM	
CONTENTS	
1	T0. Introduction to Physics and Measurements.
1.1	T1. Vectors.
1.2	T2. Kinematics of the particle.
1.3	T3. Relative movement.
2	T4. Particle dynamics.
2.1	T5. Work and energy.
3	T6. Particle systems and collisions.
3.1	T7. Rigid solid dynamics.
3.2	T8. Oscillating movement.
4	T9. Heat and Thermodynamics.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Lab sessions. These are mandatory and must have a 5.0 average in order to be eligible for evaluation. The reports from the laboratory sessions will be graded. The lab grade from Physics I taken in previous years will be kept.	Others	No	No	20,00
Part 1 Midterm Exam covering Topics 1–4. Students who pass this midterm will be exempt from that part in the Final (Ordinary and Extraordinary, if applicable) exams.	Written exam	No	Yes	40,00
Part 2 Midterm Exam covering Topics 5–9. Students who pass this midterm will be exempt from that part in the Final (Ordinary and Extraordinary, if applicable) exams.	Written exam	No	Yes	40,00
Final Ordinary Exam. It covers Parts 1 and/or 2 of the syllabus that were either failed or not taken during midterms. Each part accounts for 40% of the final grade. Each part is assessed separately; a minimum of 4/10 is required in both to pass.	Written exam	Yes	Yes	0,00
TOTAL				100,00
Observations				
<p>The two parts of the course are assessed independently in all exams (midterms and finals), each contributing 40% to the final grade, with the remaining 20% from lab work. To pass, students must score at least 4/10 in each part and have a weighted average (including labs) of 5/10 or higher. Passed midterms are valid for the Ordinary and Extraordinary exams. Compensation between the two parts is allowed if each has at least a 4/10 and the overall average (including labs) is greater or equal to 5/10. In case of a new COVID-19 alert, remote assessment may be implemented.</p>				
Observations for part-time students				
<p>Part-time students may be exempt of experimental work at the lab. In such a case the marking will be included in the final exam.</p>				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Serway, R.A. 2005, Física para ciencias e ingeniería Vol. 1. (Thomson, Méjico)

Tipler, P.A. et al. 2001, Física para la ciencia y la tecnología Vol. 1. (Reverté, Madrid)

Young, Hugh D. y Freedman, Roger A. 2013 Física universitaria con física moderna Vol 1 (Pearson, México)