UNIVERSIDADE DA CORUÑA

Teaching Guide					
Identifying Data					2019/20
Subject (*)	Physics I			Code	770G01003
Study programme	Grao en Enxeñaría Electrónica Industrial e Automática				
Descriptors					
Cycle	Period	Year		Type	Credits
Graduate	1st four-month period	First		Basic training	6
Language	Spanish				
Teaching method	Face-to-face				
Prerequisites					
Department	Física e Ciencias da Terra				
Coordinador	Montero Rodríguez, María Belén		E-mail	belen.montero@udc.es	
Lecturers	Lopez Lago, Joaquin Montero Rodríguez, María Belén Ramirez Gomez, Maria del Carmen Rico Varela, Maite		E-mail	joaquin.lopez@udc.es belen.montero@udc.es carmen.ramirez@udc.es maite.rico@udc.es	
Web					
General description	The relationship between the subject and the different subjects in the degree is basic, post that provides the elementary concepts to be able to develop and learn about the subject.				

Study programme competences / results	
Code	Study programme competences / results
A7	Comprender e dominar os conceptos básicos sobre as leis xerais da mecánica, termodinámica, campos e ondas e electromagnetismo e a súa aplicación para resolver problemas propios da enxeñaría.
B1	Capacidade de resolver problemas con iniciativa, toma de decisións, creatividade e razoamento crítico.
B2	Capacidade de comunicar e transmitir coñecementos, habilidades e destrezas no campo da enxeñaría industrial.
B4	Capacidade de traballar e aprender de forma autónoma e con iniciativa.
B6	Capacidade de usar adecuadamente os recursos de información e aplicar as tecnoloxías da información e as comunicacións na enxeñaría.
C1	Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.
C2	Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.
C3	Desenvolverse para o exercicio dunha cidadanía aberta, culta, crítica, comprometida, democrática e solidaria, capaz de analizar a realidade, diagnosticar problemas, formular e implantar solucións baseadas no coñecemento e orientadas ao ben común.
C5	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
C7	Valorar a importancia que ten a investigación, a innovación e o desenvolvemento tecnolóxico no avance socioeconómico e cultural da sociedade.

Learning outcomes			
Learning outcomes	Study programme competences / results		
The student knows the concepts and fundamental laws of mechanics, fields, waves and their application.	A7		C1
Te student analyzes problems that integrate different aspects of physics, recognizing the varied physical fundaments that underlie a technical application, device or real system		B1 B2 B6	C3 C5
The student knows the units, the orders of magnitude of the defined physical magnitudes and solves basic engineering problems, expressing the numerical result in the appropriate physical units.		B1 B6	

The student correctly uses basic methods of experimental measurement or simulation and treats, presents and interprets the obtained data, relating them to the appropriate physical laws and magnitudes.		B2 B4 B6	C2 C5 C7
The student correctly applies the fundamental equations of mechanics to various fields of physics and engineering: rigid solid dynamics, oscillations, elasticity, fluids, electromagnetism and waves.	A7	B1 B4 B6	C2 C7
The student understands the meaning, utility and relationships between magnitudes, modules and fundamental elastic coefficients used in solids and fluids.		B1 B6	
The student performs mass and energy balances correctly in fluid movements in the presence of basic devices.		B1 B4	C7
The student knows the wave equation, the characteristic parameters of its basic solutions and the energetic aspects of them. Analyze the propagation of mechanical waves in fluids and solids and know the basics of acoustics.		B1 B6	C2 C7

Contents	
Topic	**Sub-topic**
The contents of this subject included in the verification memory of the degree are structured in the following eight themes. In this paragraph the correlation between the contents mentioned with the corresponding theme.	Magnitudes, units and dimensions: Theme 1 Kinematis: Theme 2 Particle's static: Theme 6 Particles's dynamics: Theme 3 Dynamic of particles systems: Theme 4 Dynamic f rigid bodies: Theme 5 Fluid mechanics: Theme 8 Mechanical waves: Theme 7
1.- UNITS, PHYSICAL MAGNITUDES AND DIMENSIONS	1.1 Physical magnitudes, Standards and Units 1.2 Dimensional analysis 1.3 Vector analysis
2.- PARTICLE?s KINEMATICS	2.1 Motion representation. Displacement, Time, and Average Velocity. Average and Instantaneous Acceleration 2.2 Motion in one dimension 2.3 Motion in two dimensions
3.- PARTICLE?s DYNAMICS	3.1 Newton?s laws of motion 3.2 Applications of Newton?s laws: Particles in Equilibrium. Dynamics of Particles 3.3 Work and Energy 3.4 Conservation of Energy
4.- DYNAMICS OF PARTICLES? SYSTEM	4.1 Center of Mass 4.2 Momentum and Impulse 4.3 Momentum Conservation 4.4 Collisions
5.- RIGID BODIES DYNAMICS	5.1 Rotation of Rigid Bodies. Moment-of-Inertia 5.2 Dynamics of rotational motion. Torque and Angular Acceleration for a Rigid Body 5.3 Conservation of Angular Momentum
6.- EQUILIBRIUM AND ELASTICITY	6.1 Conditions for Equilibrium 6.2 Center of Gravity 6.3 Elasticity
7.- WAVES/ACOUSTICS	7.1 Periodic Motion. Describing Oscillation 7.2 Mechanical waves. Types, mathematical description 7.3 The sound waves
8.- FLUID MECHANICS	8.1 Statics of fluids 8.2 Dynamic of Fluids 8.3 Viscous Fluids

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Laboratory practice	A7 B2 B4 B6 C2 C3 C7	9	15	24
Objective test	B1 B2 B6 C1 C3 C5	4	0	4
Guest lecture / keynote speech	A7 C2	21	42	63
Problem solving	A7 B1 C2 C5	21	33	54
Oral presentation	B1 B2 B4 C1 C3	1	2	3
Personalized attention		2	0	2
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description
Laboratory practice	Compulsory analysis in the laboratory. Results presentation.
Objective test	Objective written tests based on the contents of the subject. An examination test will be done in the middle of the semester.
Guest lecture / keynote speech	Oral presentation of basic concepts for understanding the subject. The agenda that appears in Step 3: Contents of this Guide is followed.
Problem solving	Reading of the proposed statements. Interpretation, formulation and resolution using the available mathematical tools. Analysis of the obtained result.
Oral presentation	Presentation of a novel subject on the field of engineering and its relation with physics.

Personalized attention	
Methodologies	Description
Laboratory practice Problem solving	The laboratory practices are compulsory to overcome the subject. The student´s groups will develop the proposed practices, all being responsible for the results obtained. The whole time they will have the follow-up of the teacher. During problem solution sessions, some typical problems will be solved in the classroom, selected from among the previously delivered bulletins. Other exercises are left as individual work of the student, both inside and outside the classroom, being supervised by the teacher. For students with part-time dedication and academic assistance, the most appropriate methodologies will be taken into account for the specific needs required by each student.

Assessment			
Methodologies	Competencies / Results	Description	**Qualification**
Laboratory practice	A7 B2 B4 B6 C2 C3 C7	Son obrigatorias. Valorarase o traballo realizado no laboratorio e o informe presentado.	10
Objective test	B1 B2 B6 C1 C3 C5	Ao finalizar o cuadrimestre realizarase unha proba obxectiva escrita de tres horas de duración sobre a totalidade os contidos da materia.	70
Problem solving	A7 B1 C2 C5	Avaliación continua mediante o seguimento do alumno/a nas clases e tutorías, valorando a comprensión que o/a alumno/a adquire da materia. Avaliación dun exercicio feito a mediados do cuadrimestre. Avaliación da presentación oral.	20

Assessment comments

For a student to be evaluated, it must be taken into account that class attendance is mandatory. There exceptional cases must be documented.
The repeating students who will do the laboratory practice during the 2018/19 academic year will be able to choose between taking the laboratory practices again and being evaluated, or not doing them and keeping the laboratory score of the previous course. The laboratory practices are compulsory, so that a student who does not perform them, has no option to pass the subject.
The students with grades of "not presented" are those who did not show up for the objective test.
Students with part-time dedication: The criteria and evaluation activities for the first opportunity will depend on the amount of dedication to said part-time. The students, who for justified reasons (employment, illness, ...) do not perform the continuous evaluation, the objective test in person represents 90% of the score. The remaining 10% corresponds to the score of the laboratory practices, which are obligatory.
The second opportunity will be governed by the same criteria as the first opportunity.
In general, the delivery of written documentary works will preferably be done in virtual format and / or computer support. If this is not possible, recycled paper, double-sided printing will be used preferably and prints of drafts and the use of plastics will be avoided.

Sources of information	
Basic	- M. Alonso y F.J. Finn (). Física. Ed. Addison - Wesley Iberoamericano - P.A. Tippler y G. Mosca (). Física para la Ciencia y la Tecnología . Ed. Reverté - F.W. Sears, M.W. Zemansky, H.D. Young y R.A. Freeman (). Física Universitaria . Addison-Wesley Iberoamericana Libro
Complementary	- O. Alcaraz, J. López, V. López (). Física. Problemas y ejercicios resueltos . Ed. Pearson-Prentice Hall - F.A. González (). La Física en Problemas. Ed. Tebar Flores - R.A. Serway (). Física . Ed. Mc. Graw ? Hill / Ed. Thomson - S. Burbano, E. Burbano, C. Gracia (). Problemas de Física. Ed. Tébar S.L

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Calculus/770G01001
Subjects that continue the syllabus
Physics II/770G01007 Fluid Mechanics/770G01016
Other comments

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.