Universida_{de}Vigo

Subject Guide 2022 / 2023

11111111				
IDENTIFYIN	G DATA			
Physics: Ph	ysics I			
Subject	Physics: Physics I			
Code	007G410V01103			
Study	Grado en			
programme	Ingeniería			
Description	Aeroespacial	Char	N	Our day of
Descriptors	ECIS Credits	Choose	Year	Quadmester
T	b #EastlichEnissedha	Basic education	Ist	LST
Teaching	#EnglishFriendly			
language	Spanish			
Department	Laranza Canzalaz Maria da las Nieuros			
Locturere	Lurenzo Gonzalez, Maria de las Nieves			
Lecturers	Capiera Crespo, Alejandro Jacobo Lorenzo Gonzalez, Maria do las Niovos			
E-mail				
Web	http://apro.uvigo.es/			
General	This course will provide the fundamental basis of	f mechanics in particular	classical mechanic	
description	Mechanics is the branch of the Physics focused of	on the study of the behav	iour of bodies at res	st or moving
description	bodies.	in the study of the senar		se of moving
	During the course of Physics I, the basis of classi	ical mechanics will be stu	died, which will be	extended in the
	next year in the course of Classical Mechanics.		· · · , · · · · ·	
	Both basics of the kinematics and the dynamics	will be addressed in this	Physics I.	
	The kinematics is devoted to study the moveme	nt of the bodies, without	considering the cau	ses of that
	movement. That is, the kinematics gives answer	to the question of How d	oes a body move?.	On the other
	hand, the dynamics is devoted to study the caus	ses of the movement of the	ne bodies and its ev	olution. That is,
	the dynamics, unlike the kinematics, gives answ	er to the question Why is	this body moving?	
	This course is fundamental since the principles of	of the phenomena related	with the behaviour	of the bodies (at
	rest or moving bodies) are based on this course.	and the second former the second	ala ana a' na atanta t	a sa al da ila li a susa sa la i
	English Friendly subject: International students r	nay request from the tea	cners: a) materials	and bibliographic
	reierences in English, b) tutoring sessions in Eng	liish, c) exams and assess	sments in English.	
Skills				
Code				
A1 That the	e students demonstrate to possess and understar	id knowledge in an area o	of study that is part	of the general
educati	on (second level), and often found at a level that,	although based on advar	nced textbooks, also	o includes some
aspects	that involve knowledge from the avant-garde of	the field of study		
B2 Plannin	Planning, documentation, project management, calculation and manufacturing in the field of aeronautical engineer		tical engineering	
(in acco	ordance with what is established in section 5 of or	der CIN / 308/2009), aero	space vehicles, pro	pulsion systems,
aerospa	ace materials, airport infrastructures, air navigatio	on intrastructures and spa	ice management, ai	ir trame and
C2 Undered	ansport management systems.			
CZ Undersi	nuerstanding and mastery of the basic concepts about the general laws of mechanics, thermodynamics, fields and layes and electromagnetism and their application to solve problems related to opgingoring.			
	waves and electromagnetism and their application to solve problems related to engineering.			
	Capability of oral and written communication in native lenguage			
	Capability of oral and Written communication in native lenguage			
D5 Capabil	Capability to solve problems and draw decisions			
	apability to solve problems and draw decisions			
	apapility for critical and colf critical reaconing			
Do Capabil	ing for critical and self-critical reasoning			

Learning outcomes Expected results from this subject

Training and Learning Results

Knowledge and understanding of the basic principles of physics and their application to the analysis and resolution of engineering problems.	A1		C2	D1 D3 D5 D8
Knowledge, understanding and application of the general laws of the Classical Mechanics, with special upsetting in the relative movements, the cinematic and dynamics of the point, the theorems of the quantity of movement and of the moment kinetical, and the cinematic, static and		B2	C2	D4 D5 D6
dynamics of the rigid solid.				

Contents	
Topic	
1) Basic vectorial Calculus	- Vectors and scalars
	- Coordinate system
2) Kinematics	- Reference system, trajectories, velocity and acceleration
	- Rectilinear and curvilinear motion
	- Tangential and normal accelerations
3) Relative movement	- Translation
	- Rotation
	- Components of the acceleration
4) Newton's laws	- Force
	- Newton□s first law: inertia
	- Newton□s second law: weight
	 Newton
	- Linear momentum
	- Angular momentum
	- Work and energy
5) Particle system	- External and internal forces
	- Linear impulse. Collisions
	- Centre of mass.
	 Linear momentum, angular momentum, work and energy of a particle
	system
6) Rigid solids	 Concept of rig solid. Centre of mass
	- Moment of inertia
	- Translation
	- Rotation around a fixed axis
	- Rolling motion
Particle statics and rigid solid statics	 General equations of the equilibrium of rigid solid
	- System of forces
	- Stability
8) Fluid statics	- Density and hydrostatic pressure
	- Archimedes[] principle
	- Surface tension. Capillarity

Planning			
	Class hours	Hours outside the classroom	Total hours
Lecturing	32	64	96
Autonomous problem solving	3	6.5	9.5
Research based methodologies	1	4	5
Programmed instruction	0	6	6
Laboratory practical	12	0	12
Essay questions exam	2.5	0	2.5
Report of practices, practicum and externa	l practices 0	5	5
Self-assessment	0	12	12
Problem and/or exercise solving	2	0	2
*The information in the planning table is fo	r guidance only and does no	t take into account the hete	erogeneity of the students.

Methodologies	
	Description
Lecturing	The theory of the course will be presented and it will be applied to solve problems
Autonomous problem solving	The student should solve exercises following some instructions.
Research based methodologies	Improves information processing in specific domains by using scientific research activities.

Programmed instruction It consists of the presentation of a matter divided into several teaching units, of smaller size, with issues at the end of each teaching unit in order to strengthen the acquired knowledge. These activities can be performed in person or virtually.

Laboratory practical

Tasks related with the contents of the course will be carried out in the laboratory. The realisation of these tasks is mandatory to pass the course

Personalized assistance		
Methodologies	Description	
Laboratory practical	During the tasks in the laboratory, a personal follow-up will be carried out to guide the students to achieve the objectives	
Research based methodologies	Tutoring sessions will be scheduled to solve any doubt of the students	

Assessment Description Qualification Training and Learning Results Research based Students will present the results of their research. The maximum marks of 10 D3 methodologies this part will be 10% of the final total marks. D4 D6 Laboratory practical In order to pass the course, laboratory tasks should be carried out. 10 C2 D1 A1 Continuous assessment will be used during the realisation of the tasks. D3 The maximum marks of this part will be 10% of the final total marks. D4 D6 D8 Essay guestions exam There will be an exam that include guestions and exercises. The maximum B2 C2 D4 60 marks of this part will be 60% of the final total marks. However, a D5 minimum of 5 over 10 has to be reached in the exam to pass the course. Self-assessment At the end of each topic, students will be able to answer a multiple-choice C2 D6 10 questionnaire which may account for up to 10% of the final mark. Problem and/or In the middle of the syllabus there will be a short evaluation test 10 C2 D6 exercise solving consisting of solving problems and/or questions. This test can count for up

Other comments on the Evaluation

The second chance assessment system is the same as the first chance assessment system, maintaining the grades obtained for research-based methodologies, problem solving and/or exercises and practicals.

to 10% of the final mark. The mark for the developmental exam may be 4 out of 10 to be averaged with the rest of the marks if the student passes

Assessment dates:

The exam calendar officially approved by the Xunta de Centro is published on the website:

http://aero.uvigo.es/gl/docencia/exames

The laboratory practicals must have been completed in order to be able to sit the second chance exam.

the exercise resolution test with at least 50% of the mark.

Students who are unable to attend classes must inform the teacher. In this case, the exam will count for 90% of the mark and the practicals for 10%.

In summary:

Out of the 100% of the mark of the subject we have:

- Exam: up to 60%. It is necessary to get a 5 out of 10 in the exam to pass the subject.
- Self-assessment test: up to 10%.
- Laboratory practicals: up to 10%. It is compulsory to pass the internship in order to pass the subject.
- Research work: up to 10%.

-Evaluation test of problems and/or exercises: up to 10%.

Assessment for students who do not opt for continuous assessment.

- Examination/exams: up to 90%, a minimum of 5 out of 10 must be obtained to pass the course.

- Laboratory practicals: up to 10%. It is compulsory to pass the internship in order to pass the subject.

VERY IMPORTANT:

In order to add up all the percentages, the student must get at least 5 out of 10 in the exam grade. In the case of not getting a 5 in the exam, the grade that will appear in the minutes will be the exam grade. The duration of the final exam will be approximately 2.5 hours.

In the event that the student obtains 50% or more of the mark in the evaluation test of problem solving and/or exercises, he/she will have to obtain at least a 4 out of 10 in the exam mark to be able to add up all the percentages. In the case of not achieving a 4 in the exam, the mark that will appear in the minutes will be the exam mark.

Students who fail at the first opportunity and do not attend class may sit the second opportunity exam covering all the content of the subject, provided that they have completed the laboratory practicals.

In special cases in which, for justified and previously notified reasons, students cannot attend the practicals or take part in the continuous assessment 100% of the mark will correspond to a final exam in which all the competences of the subject will be evaluated.

Final exam: students who choose to take the final exam will be assessed only with the exam (which will be worth 100% of the mark). If they do not attend the exam, or do not pass it, they will be assessed in the same way as the rest of the students".

If plagiarism is detected in any of the tests, the final grade will be SUSPENSED (0) and the fact will be communicated to the management of the Centre for the appropriate effects.

Sources of information

Basic Bibliography

Sears-Zemansky, Física Universitaria Volumen I, 12ª, Addison-Wesley, 2009

Alcaraz i Sendra O., López López J., López Solana Vicente, **Física. Problemas y ejercicios resueltos**, 1ª, Pearson Prentice Hall, 2006

Complementary Bibliography

Serway R.A., Jewett J.W., Física para ciencias e ingeniería, 7ª, Cengage Learning, 2008

Tipler, Paul Allen, Física, 5ª, Reverte, 2003

Ferdinand P. Beer ; E. Russell Johnston, Jr. ; Elíiot R. Eisenberg, **Mecánica vectorial para ingenieros (Estática)**, 8ª, McGraw-Hill Interamericana, 2007

Ferdinand P. Beer ; E. Russell Johnston, Jr. ; Phillip J. Cornwell, **Mecánica vectorial para ingenieros (Dinámica)**, 9^a, McGraw-Hill Interamericana, 2010

Burbano de Ercilla, Santiago, Burbano García, Enrique y Carlos Gracia Muñoz, **Problemas de Física**, 27ª, Tébar, 2006 Hugh D. Young, Roger A. Freedman, **Sears and Zemansky's university physics : with modern physics**, 13ª, Addison-Wesley, 2012

Recommendations

Subjects that continue the syllabus Physics: Physics II/007G410V01202

Subjects that are recommended to be taken simultaneously

Mathematics: Linear algebra/007G410V01102 Mathematics: Calculus I/007G410V01101