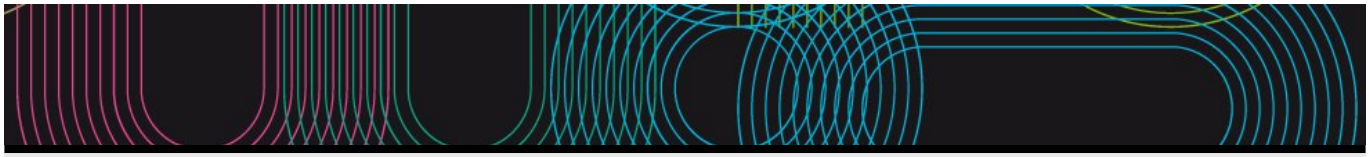

IDENTIFYING DATA				
Physics: Physics 1				
Subject	Physics: Physics 1			
Code	V11G200V01102			
Study programme	(*)Grao en Química			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	1st
Teaching language	Spanish			
Department				
Coordinator	Pérez Iglesias, Mª Teresa			
Lecturers	Peón Fernández, Jaime Francisco Pérez Iglesias, Mª Teresa			
E-mail	tpigles@uvigo.es			
Web	http://faitic.uvigo.es/			
General description	Broadly Physics is the general scientific analysis of nature, with the goal of understanding how the universe behaves. It is fundamentally an experimental science. The theories that are developed are tested with observations. From such a wide definition, different perspectives or application levels can be adopted, from microscopic phenomena to macroscopic ones. Physics is thus the basis of innumerable scientific and technological applications. In particular for the student of Chemistry, it is a fundamental tool to understand theories and methods belonging to that of domain of science.			

Competencies	
Code	
A1	(*)Demostrar coñecemento e comprensión de feitos esenciais, conceptos, principios e teorías en: aspectos principais da terminoloxía química, nomenclatura, conversións e unidades
B1	(*)Comunicarse de forma oral e escrita en polo menos unha das linguas oficiais da Universidade
B3	(*)Aprender de forma autónoma
B4	(*)Procurar e administrar información procedente de distintas fontes
B6	(*)Manexar as matemáticas, incluíndo aspectos tales como análise de erros, estimacións de ordes de magnitude, uso correcto de unidades e modos de presentación de datos
B7	(*)Aplicar os coñecementos teóricos á práctica
B8	(*)Traballar en equipo
B12	(*)Planificar e administrar adecuadamente o tempo
B13	(*)Tomar decisións
B14	(*) Analizar e sintetizar información e obter conclusións
B15	(*)Avaliar de modo crítico e construtivo o entorno e a si mesmo

Learning aims	
Expected results from this subject	Training and Learning Results
Describe the framework of classical mechanics and calculate for a mechanical system the values of its different magnitudes.	A1 B1 B3 B4 B6 B8 B12 B13 B14 B15

Explain the importance of the conservation theorems and apply some of them.	A1	B1 B3 B4 B12 B13 B14 B15
Enunciate the postulates and principles of thermodynamics.	A1	B1 B3 B4 B12 B13 B14
Explain the concept of thermodynamic system and its description using the corresponding variables and thermodynamic potentials.	A1	B3 B6 B7 B12 B13 B14 B15
Define the different temperature scales. Convert temperature values from one scale to another.	A1	B1 B3 B4 B6 B12 B13 B14
Calculate the work carried out by a thermodynamic system and the heat exchanged with the environment, as well as the variation of internal energy, enthalpy and entropy in quasiestatic processes.	A1	B1 B3 B4 B6 B12 B13 B14

Contents

Topic	
1. DESCRIPTION OF THE PHYSICAL REALITY	Introduction - Physical magnitudes and units - Dimensional analysis Errors.
2. KINEMATICS OF THE POINT AND RIGID BODY	Material point - Vector position, velocity and acceleration - Tangent and normal components of the acceleration - Study of some movements: rectilinear and plane - Rigid body.
3. PRINCIPLES OF THE DYNAMICS	Concept of force - Newton Law s - Newton´s theory of gravitation.
4. DYNAMICS OF THE PARTICLE	Equations of motion - Momentum and angular momentum - Radial Forces: Conservation of the angular momentum - Work and power - Kinetic Energy - Conservation of the mechanical energy - Non conservative forces. The conservation of energy. - Energy diagrams.
5. OSCILLATING MOTION	Simple harmonic Motion: Kinematics, Dynamics and Energy.
6. DYNAMICS OF SYSTEMS OF PARTICLES	Internal and external forces - Equation of motion for the center of mass - Work of external and internal forces Collisions.
7. THE RIGID BODY	Rigid Body: Degrees of freedom, Rotational motion: Moment of inertia, angular momentum, Kinetic Energy.
8. FLUIDS	Pressure and density. Pressure in a fluid at rest. Measurement of pressure Surface Tension Capillarity. Jurin´s Law Tate´s Law.
9. INTRODUCTION TO THE THERMODYNAMICS. THERMOMETRY	Macroscopic and microscopic description - Thermal equilibrium - Zero´th law of Thermodynamics. Temperature Measure of temperature. Thermometers - Ideal Gas. Ideal gas temperature scale.
10. HEAT AND WORK	Thermodynamic Equilibrium. Equations of state. Quasiestatic Processes - Thermodynamic work - Heat capacity and specific heat. Latent heat.
11. THE FIRST LAW OF THERMODYNAMICS	The First Law of Thermodynamics - Internal Energy, enthalpy and heat capacities of the ideal gases. Mayer´s Law -Adiabatic changes of an ideal gas.
12. THE SECOND LAW OF THERMODYNAMICS	Introduction - Second Law: Clausius and Kelvin-Planck Statements - Cycle of Carnot. Theorem of Carnot- Thermodynamic Scale of Temperatures - Inequality of Clausius- Entropy.

Planning

	Class hours	Hours outside the classroom	Total hours
Seminars	26	28.6	54.6
Master Session	26	28.6	54.6
Tutored works	2	13	15
Troubleshooting and / or exercises	4.5	15.3	19.8
Short answer tests	1.5	4.5	6

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Seminars	a) Exercises and problems will be solved,fundamentally, by the students. Problems sheets will be available with sufficient anticipation, either at the course web page or in printed form. b) Doubts and difficult concepts will be discussed and clarified. c) Diverse tasks that students have to carry out will be programmed. d) Diverse tasks that students have to carry out will be tested.
Master Session	The student can find information on lectures at the web platform Thema. During the first months of the course this material will also be available in printed form. a) In each topic the specific objectives will be analyzed. Its need and the possible applications will be indicated. b) The way to get objectives will be indicated. Emphasis will be made on those aspects that are more problematic and difficult. Different examples will be solved. c) Bibliographic references will be proposed
Tutored works	a) The guided activities will be carried out individually or in groups. b) In order that the students have a clear idea of the objectives to reach and the available material, information about these ones will be provided with enough time in advance.

Personalized attention

Methodologies	Description
Tutored works	Guided activities and, in some cases, the activities that will carry out in Seminars will need personalized attention. Voluntary Tutorials allows the clarification of doubts on an individual basis.

Assessment

	Description	Qualification
Seminars	Solving homework problems and other assignments that have been carried out in seminars.	15
Tutored works	They will allow to check the Transversal Competences.	10
Troubleshooting and / or exercises	Three tests written: a) The marks of the two first tests will be maintained until the final exam of February. b) The third test will be done with the final exam. c) The mínimum mark to pass each exam will be 5 out of 10. d) In February each student will have the opportunity to repeat the test he/ she has failed or those where he/she wishes to improve the mark previously obtained.	60
Short answer tests	Three tests written: a) The marks of the two first tests will be maintained until the final exam of February. b) The third test will be done with the final exam. c) In February each student will have the opportunity to repeat the test he/ she has failed or those where he/she wishes to improve the mark previously obtained.	15

Other comments on the Evaluation

July assessment: a) Written test to recover the written tests that were failed in February. The criteria of evaluation in July will be the same as in the final February assessment.

Sources of information

Tipler, P.A., Mosca G.,, **Física para la ciencia y la tecnología (2 volumes)**, 2010,

Gettys, E.; Kéller, F.J., Skove, M.J., **Física Clásica y Moderna**, 1991,

Serway, R.A., **Física**, 2009,

Zemansky, M.W. e Dittman, R.H., **Calor y Termodinámica**, 1990,

José Mª de Juana, **Física General (2 tomos)**, 2003,

Giambernardino, V., **Teoría de errores**, 1981,

Recommendations

Subjects that continue the syllabus

Physics: Physics 2/V11G200V01201
(*)Química, física e xeoloxía: Laboratorio integrado II/V11G200V01202
Physics 3/V11G200V01301

Subjects that are recommended to be taken simultaneously

(*)Química, física e bioloxía: Laboratorio integrado I/V11G200V01103

Other comments

It is recommended that students had studied Physics and Mathematics in 2nd level of high school.

In particular students should be familiar with:

- Vector algebra.
- Matrix algebra.
- Polynomial algebra.
- Graphic representation of polynomial, trigonometrical, logarithmic and exponential functions.
- Differential and integral calculus.