Teaching Guide				
Identifying Data				2015/16
Subject (*)	Física 2		Code	610G01004
Study programme	Grao en Química			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	2nd four-month period	First	FB	6
Language	SpanishGalician			
Teaching method	Face-to-face			
Prerequisites				
Department	Física			
Coordinador	Rilo Siso, Esther	E-mail	esther.rilo.siso@udc.es	
Lecturers	Rico Varela, Maite Rilo Siso, Esther	E-mail	maite.rico@udc.es esther.rilo.siso@udc.es	
Web				
General description	Provides knowledge of General Physics required for substantiation of the laws and phenomena of chemistry. This is a subject that is the link between mathematics and chemistry in the sense of giving a formal formulation of scientific observations that establish laws and results without which you can not "close" the scientific method. The laws of physics provide the basic ingredients in which most sciences are supported, as well as instrumentation and measurement techniques used in all scientific fields, and especially in chemistry. Hence its importance and presence in the first year of the degree, since along with Physics 1 provides students with the necessary basis for understanding matters of other modules and courses for the degree.			

Study programme competences	
Code	Study programme competences
A1	Ability to use chemistry terminology, nomenclature, conventions and units
A3	Knowledge of characteristics of the different states of matter and theories used to describe them
A12	Ability to relate macroscopic properties of matter to its microscopic structure
A14	Ability to demonstrate knowledge and understanding of concepts, principles and theories in chemistry
A15	Ability to recognise and analyse new problems and develop solution strategies
A19	Ability to follow standard procedures and handle scientific equipment
A20	Ability to interpret data resulting from laboratory observation and measurement
A22	Ability to plan, design and develop projects and experiments
A23	Critical standards of excellence in experimental technique and analysis
A24	Ability to explain chemical processes and phenomena clearly and simply
A25	Ability to recognise and analyse link between chemistry and other disciplines, and presence of chemical processes in everyday life
A27	Ability to teach chemistry and related subjects at different academic levels
B1	Learning to learn
B2	Effective problem solving
B3	Application of logical, critical, creative thinking
B4	Working independently on own initiative
B5	Teamwork and collaboration
B7	Effective workplace communication
C1	Ability to express oneself accurately in the official languages of Galicia (oral and in written)
C3	Ability to use basic information and communications technology (ICT) tools for professional purposes and learning throughout life
C6	Ability to assess critically the knowledge, technology and information available for problem solving

Learning outcomes	
Learning outcomes	Study programme competences

Dispoñer dos fundamentos teóricos mínimos que permitan a comprensión dos aspectos da química relacionados coa mecánica de fluidos e cos fenómenos eléctricos e magnéticos.	A1 A3 A12 A14 A25		C1
Saber reducir os problemas reais ós seus aspectos máis esenciais e aplicalos ó campo da química	A14 A15 A27	B1 B2 B3 B4 B5 B7	C1 C3 C6
Aplicar as técnicas básicas de laboratorio, incluindo os cálculos necesarios e expresando os resultados de manera axeitada. Utilizar o material e aplicar as normas básicas de seguridade para traballar nun laboratorio.	A19 A20 A22 A23 A24	B1 B2 B3 B5 B7	C3 C6

Contents	
Topic	**Sub-topic**
1. Field theory	Scalar and vector field Gradient, divergence and rotational Circulation and flux Central force fields
2. Fluids	Ideal fluids Real fluids Surface phenomenon
3. Gravity	Gravitational field Gravitational potential energy
4. Electricity	Electric field and potential Capacity Electric current and directs current circuits
5. Magnetism	Magnetic field Magnetic induction Alternating current circuits
6. Oscillations and waves	Oscillations Waves motion
7. Ligth	Properties Optical images Interferences and difraction
Practical teaching: surface tension and density measurements for different methods, resistance measurement using a Wheatstone bridge, mass/charge rate for electron, measurements of voltage, resistance and current in electrical circuits.	

Planning

Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A1 A3 A12 A14 A15 A24 A25 A27 B1 B2 B3 C6	27	67.5	94.5
Problem solving	A14 A15 A27 B1 B2 B3 B4 B5 B7 C1 C3 C6	9	13.5	22.5
Laboratory practice	A19 A20 A22 A23 A24 B1 B2 B3 B5 C3 C6	15	15	30
Mixed objective/subjective test	A1 A3 A12 A14 A15 A24 A25 B2 B3 C6	2	0	2
Personalized attention		1	0	1
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description
Guest lecture / keynote speech	During these sessions, teacher will explain lessons including different formats (theory, problems and general examples), emphasizing the more important aspects and in the more difficult ones.
Problem solving	In this sessions, some problems related to theory contents explained before will be proposed and solved. Students must solve this problems and questions under teacher supervision, individually or in groups. There will be included in these classes activities that imply the participation of the pupils, that will contribute to the continuous assessment. So teacher can observe the difficulties of comprehension that every pupil presents in the resolution of problems.
Laboratory practice	Students will perform laboratory practice for the application of knowledge acquired in the keynote sessions and problem solving. With this methodology, they acquire skills needed to work properly in a physics lab, which includes the use of instruments for measurement, data processing and analysis of results of physic properties and magnitudes. A guide for each practice will be given to the student, and they will have all necessary material to mount and do them.
Mixed objective/subjective test	It is the test for the evaluation of knowledge, which allows teacher assessing the level of student learning.

Personalized attention	
Methodologies	Description
Laboratory practice Problem solving	Students will be attended individually to help them to understand and resolve all problems related with the subject they can have. Moreover, teacher regularly invite students to tutorials with the intention of receiving the necessary guidance.

Assessment			
Methodologies	Competencies	Description	**Qualification**
Laboratory practice	A19 A20 A22 A23 A24 B1 B2 B3 B5 C3 C6	Attendance to Laboratory practices is MANDATORY, so you cannot pass the course without making them. The highest mark that can be obtained is 1.5 points, and the minimum one required to pass them is 0.7. It will be evaluated on the basis of participation and results delivery of each session, and a test that will take place during the last session. Competences evaluated A19, A20, A22, A23, A24, B1, B3, B5, B7, C3	15

Problem solving	A14 A15 A27 B1 B2 B3 B4 B5 B7 C1 C3 C6	Attendance will be evaluated (up to 0,5 points). Participation on the resolution of problems and exercises also will be evaluated. Teacher may periodically collect exercises or questions proposed during these sessions. Competences evaluated: A1, A3, A12, A15, B1, B2, C1	15
Mixed objective/subjective test	A1 A3 A12 A14 A15 A24 A25 B2 B3 C6	Examination accounts for 70% of the final grade During the term a mid-course assesment exam will be done. Competences evaluated: A1, A3, A12, A14, A15, B2, C1.	70

Assessment comments
Exam mark should not be less than 4 (up to 10). The final mark must be 5 or higher to pass course, and will be calculated as follows: exam mark*0.7+laboratory+problem solving. If a student, having a final mark higher than 5, fails the minimum mark in any activity, he/she will have a mark of 4.5, i.e., Fail. In the July opportunity will be saved the qualifications of Laboratory and Seminars of problems. For qualifying students as NON PRESENTED they must not have participated in more than 25% of evaluable scheduled activities. Students evaluated on the second opportunity will be eligible for the honors if the maximum number of that for the corresponding course was not covered at the first opportunity. The laboratory practices must be done in the official calendar published at the beginning of the term. Concerning successive academic years, the teaching-learning process, including assessment, refers to an academic course, and therefore start again with each new course, including all activities and evaluation procedures were scheduled for that course.

Sources of information	
Basic	- Tippler & Mosca (). Física para la ciencia y la tecnología . Reverté - Sears, Zemansky, Young & Freedman (). Física Universitaria . Addison Wesley Longman - Fidalgo & Fernández (). Física General. Everest
Complementary	- Burbano de Ercilla, Burbano García & Gracia Muñoz (). Problemas de Física. Mira - Lea & Burke (). Física, la naturaleza de las cosas. Paraninfo - Angel Franco García (2006). Prácticas de Física. http://www.sc.ehu.es/sbweb/fisica_/

Recommendations
Subjects that it is recommended to have taken before
Matemáticas 1/610G01001 Física 1/610G01003
Subjects that are recommended to be taken simultaneously
Matemáticas 2/610G01002
Subjects that continue the syllabus

Other comments
You need to have knowledge of physics and mathematics from high school. It is recommended to attend the leveling course taught in the Facultade de Ciencias in September.

(*)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.