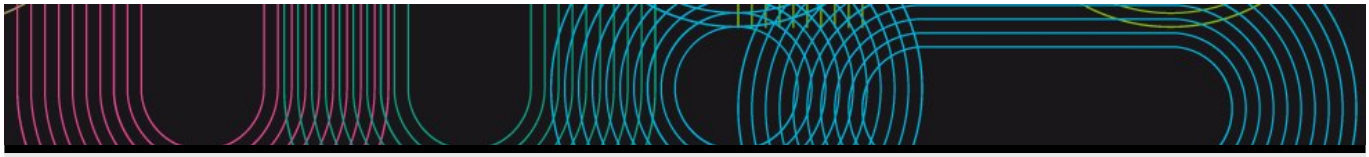

IDENTIFYING DATA				
Physics: Physics 2				
Subject	Physics: Physics 2			
Code	V11G201V01107			
Study programme	(*)Grao en Química			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	2nd
Teaching language				
Department				
Coordinator	Pérez Iglesias, María Teresa			
Lecturers	Pérez Iglesias, María Teresa			
E-mail	tpigles@uvigo.es			
Web	http://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	Students have demonstrated knowledge and understanding in a field of study that builds upon their general secondary education, and is typically at a level that, whilst supported by advanced textbooks, includes some aspects that will be informed by knowledge of the forefront of their field of study
A2	Students can apply their knowledge and understanding in a manner that indicates a professional approach to their work or vocation, and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study
B1	Autonomous learning ability
C22	Know and apply the foundations of Physics necessary to understand the theoretical and practical aspects of Chemistry that need it
C29	Demonstrate ability for numerical calculations and interpretation of experimental data, with correct use of units and estimation of uncertainty
D3	Ability to communicate in both oral and written form in Spanish and / or Galician and / or English

Learning outcomes				
Expected results from this subject	Training and Learning Results			
Determine the electric field of discrete point charges or a continuous charge distribution. The case of high symmetry is also considered.	A1	B1	C22	D3
Describe the effect of an electrostatic field on dielectrics and conductors.	A1 A2	B1	C22	D3
Determine the physical effects of electrical currents.	A1	B1	C22	D3
Calculate the characteristics and type of trajectory of charged particles in an electric or magnetic field.	A1 A2	B1	C22	D3
Distinguish the different material behaviours in a magnetic field.	A1 A2	B1	C22	D3
Explain the difference between conservative and non conservative electric fields.	A1	B1	C22	D3
Describe unified the electromagnectic field by Maxwell's equations.	A1 A2	B1	C22	D3
Deduce the equation of an electromagnetic radiation and characterize it.	A1	B1	C22 C29	D3
Handle different instrumentation which is usual in electromagnetic lab (as polymeter, power supply, oscilloscope, etc.) reproducing basic experiments.	A1	B1	C22 C29	D3

Contents	
Topic	
1.-BASIC THEORY OF FIELDS.	- Vector functions - Scalar and vector fields - Line integral - Conservative fields. Potential - Central fields - Flux, divergence and curl of a vector field
2. ELECTROSTATICS	- Electric charge. Conductors and insulators - Coulomb's Law - Superposition principle. Electric Potential - Electric field - Potential and field created by an electric dipole. Effect of electric field on a dipole - Gauss´ theorem
3. ELECTRIC FIELDS IN CONDUCTORS AND INSULATORS.	- Effect of electric field on a conductor - Charge distributions on electrostatic conductors - Capacitors and capacitance - Effect of a dielectric between the plates of a capacitor - Effect of electric field on a dielectric
4. DIRECT CURRENT	- Direct Current. Current Density - Ohm's Law. Conductivity - Joule´s Law - Electromotive force - Kirchoff´s Law
5. MAGNETIC FIELD	- Phenomenoly. Causes of magnetism - Biot and Savart´s Law. Examples - Ampère's theoreme - Charged particles in a static magnetic field - Introduction to magnetism in matter
6. ELECTROMAGNETIC INDUCTION	- Magnetic Flux. Ampère's Law - Phenomenology - Faraday´s law. Lenz´s law - Mutual inductance and self-inductance
7. ELECTROMAGNETIC WAVES	- Maxwell's Equations. Ampère-Maxwell's law - Plane Electromagnetic Waves - Energy of the electromagnetic waves - Electromagnetic spectrum

Planning			
	Class hours	Hours outside the classroom	Total hours
Seminars	26	31.2	57.2
Laboratory practical	12	13.2	25.2
Lecturing	26	28.6	54.6
Essay questions exam	2	6	8
Presentation	0	5	5

*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) The exercises and problems will be solved, by the students or by the teacher. a) Problem sheets will be available with sufficient anticipation, either at the course web page or in printed form. b) The different tasks that the students have to carry out will be programmed. c) The different tasks that students have to carry out, as presentations based on discussions or the first test, will be assessed.
Laboratory practical	a) Laboratory activities will be carried out in groups. b) In order that the students have a clear idea of the objectives to reach and the available material, information about laboratory work will be provided with enough time in advance. c) In the laboratory, students will be assisted by a teacher.
Lecturing	a) In each topic the specific objectives will be analyzed. Its need and the possible applications will be indicated. b) The way to reach 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 d) Diverse tasks that students have to carry out will be programmed.

Personalized assistance

Methodologies	Description
Seminars	Doubts will be discussed and clarified individually or during the debates that may arise.
Laboratory practical	The questions that can arise during the conduct of the practices will be clarified .

Assessment

	Description	Qualification	Training and Learning Results			
Laboratory practical	Practices of laboratory: a) They are compulsory for all the students. b) They are compulsory to pass the subject. c) The minimum mark to pass will be of 5 out of 10. d) The student's laboratory work will be monitored and given a mark. e) The report of the practices, elaborated by the student, will be assessed.	20	A1	B1	C22 C29	D3
Essay questions exam	Continuous evaluation. Three written tests.They will be 70% of the final mark: a) The minimum qualification to pass each one of these tests will be of 5 out of 10. b) The first test will be written during seminar time. c) The third test will be done with the first term final exam. d) The marks of the two first tests will be kept until the first extraordinary exam (june). e) At the first term's final exam 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. The students who do not wish to follow the continuous evaluation will have one written test, which will contribute 80% of the final mark: a) The exam will have three parts. b) It is neccesary to pass each one of these parts to pass the subject. The minimum qualification to pass each part will be of 5 out of 10.	70-80	A1 A2	B1	C22	D3
Presentation	Intended for students who wish to follow the continuous evaluation. Students will work in groups.They will solve and they will debate problems, questions, summaries of readings, etc. that they will present or will explain to their classmates.	10	A1 A2		C22	D3

Other comments on the Evaluation

Sources of information

Basic Bibliography

José Mª de Juana, **Física General , vol. 2**, 2ª edición, Pearson,

Tipler P.A.; Mosca G., **Física para la Ciencia y la Tecnología , vol. 2**, 6ª edición, Reverté,

Serway & Jewett, **Física para ciencias e ingeniería, vol. 2,**, 9ª edición, Cengage Learning,

Gettys E.; Keller F.; Skove M., **Física para Ingeniería y Ciencias**, 2ª edición, McGraw-Hill Interamericanal,

Young & Freedman, **Física Universitaria vol. 2,**, 12ª edición, Pearson Educación,

Complementary Bibliography

Recommendations

Subjects that are recommended to be taken simultaneously

Mathematics: Mathematics 2/V11G201V01108

Chemistry: Chemistry 2/V11G201V01109

Subjects that it is recommended to have taken before

Physics: Physics I/V11G201V01102

Mathematics: Mathematics 1/V11G201V01103

Chemistry: Chemistry 1/V11G201V01104

Contingency plan

Description

=== EXCEPTIONAL PLANNING ===

Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified
The three educational methodologies would be modified. They would be transformed from face-to-face to remote format using by default the tools provided by the University through the Remote Campus.
* Non-attendance mechanisms for student attention (tutoring)
The tools provided by the University as Virtual Office would be mainly used.
* Modifications (if applicable) of the contents
The contents would not be modified.
* Additional bibliography to facilitate self-learning
The basic bibliography does not need to be adapted
The complementary bibliography does not depend on the teaching format