IDENTIFYING DATA

Physics: Physics II

Subject	Physics: Physics II
Code	V11G200V01201
Study programme	(*)Grao en Química

Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	2nd

Teaching language	Galician
Department	
Coordinator	Salgueiriño Maceira, Verónica
Lecturers	Garcia Sanchez, Josefa
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General description	"Machine translation into english of the original teaching guide"
	Physics, like scientific discipline, occupies, in general, of the description of the components of the matter and of his mutual interactions, developing theories that, in a formal and consistent way, have an agreement with the empirical knowledge of the reality. From a so wide definition, can adopt distinct perspectives or levels of application, from the microscopic phenomena (at atomic scale) to the macroscopic ones, that give place to his distinct branches. Physics, in this way, is basic precursor of countless scientific and technological applications and, in particular for the student of Chemistry, is indispensable like base and tool to understand developments and theories that will be treated specifically in other matters of the plan of studies of the degree.

Competencies

Code	
C23	Present oral and written scientific material and scientific arguments to a specialized audience
D1	Communicate orally and in writing in at least one of the official languages of the University
D3	Learn independently
D4	Search and manage information from different sources
D5	Use information and communication technologies and manage basic computer tools
D6	Use mathematics, including error analysis, estimates of orders of magnitude, correct use of units and data representations
D7	Apply theoretical knowledge in practice
D8	Teamwork
D9	Work independently
D12	Plan and manage time properly
D14	Analyze and synthesize information and draw conclusions

Learning outcomes

Expected results from this subject	Training and Learning Results	
2. Explain the utility of the electrostatic potential and calculate it for a distribution of particles loaded so much discreet like continuous.	C23	D1
		D3
		D4
		D5
		D6
		D9
		D12
		D14

3. Calculate the polarisation and the dipolar moment in simple cases.	C23	D1 D3 D5 D6 D12 D14
4. Explain the electrostatic properties of a driver.	C23	D1 D3 D4 D5 D6 D7 D12 D14
5. Describe cualitatively from the atomic point of view the effect of an electrical field on a dielectric.	C23	D1 D3 D4 D5 D6 D12 D14
6. Determine the physical effects of the electrical current.	C23	D1 D3 D4 D5 D6 D7 D12 D14
7. Calculate the characteristics and type of path of loaded particles in an electrical or magnetic field.	C23	D1 D3 D5 D6 D8 D12 D14
8. Distinguish the materials by his behaviour in a magnetic field.	C23	D1 D3 D5 D6 D12 D14
9. Calculate the magnetisation and the magnetic moment in simple cases.	C23	D1 D3 D4 D5 D6 D12 D14
10. Explain the difference between conservatives and non conservative electrical fields.	C23	D1 D3 D5 D12 D14
11. Explain of qualitative form basic appearances of the interaction of the electromagnetic radiation with the matter.	C23	D1 D3 D5 D12 D14
12. Determine the limit of resolution of a network of diffraction.	C23	D1 D3 D4 D5 D6 D12 D14

Contents

Topic	
Subject 1. ELECTROSTATIC FIELD	Introduction. Electrical load. Law of Coulomb. Electrical field. Continuous distribution of Load. Lines of Electrical Field. Scalar sources of Electrical Field. Law of Gauss. Electrical Potential energy. Electrical potential. Equipotential Surfaces. Electrical dipole. Capacity and Combination of Condensers.
Subject 2. CONTINUOUS CURRENT	Introduction. Electrical current and density of current. Law of Ohm. Resistance. Electromotive Strength. Law of Joule. Calorific Power loss. Circuits of continuous current:-Association of resistances, -Rules of Kirchhoff.
Subject 3. MAGNETIC FIELD	Introduction. Magnetic strength. Strength of Lorentz. Magnetic strength on a driver by which circulates current. Magnetic field of a load in movement. Magnetic field of an element of current. Law of *Biot-*Savart. Magnetic strength between two parallel drivers. Lines of magnetic field and magnetic flow. Law of Gauss. Law of *Ampère. Magnetic materials.
Subject 4. ELECTROMAGNETIC INDUCTION	Phenomena of electromagnetic induction: experiences of Faraday, magnetic flow, laws of Faraday and of *Lenz, experience of Henry. Applications: generators and electrical receptors, mutual induction and slef-induction. Magnetic energy.
Subject 5. WAVES	Introduction. Simple Harmonic movement. Superposition Of BUT. Swings cushioned. Swings forced. Resonance. Waves in material means. Equation of wave. Harmonic waves. Interference of waves. Superposition.
Subject 6. COMMON PROPERTIES To THE DIFFERENT WAVES.	Reflection and refraction. Superposition: Interference, pulses, stationary waves. Diffraction. Doppler Effect.
Subject 7. PHYSICAL OPTICS	Nature of the light: electromagnetic waves, luminous ray, speed of propagation. Wave phenomena: dispersion, interference, diffraction of *Fraunhofer: by a slit, by a pair of equal parallel slits, networks of diffraction. Polarisation. Optical activity.

Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	24	43.2	67.2
Seminars	26	46.8	72.8
Short answer tests	3	0	3
Troubleshooting and / or exercises	3	0	3

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

Methodologies

	Description
Master Session	In the TEMA platform, at disposal of the students, there will be information on the teaching sessions. a) the specific aims pursued in each subject will be analysed, indicating needs and possible applications. b) the way to reach the aims will be shown. Those aspects result more problematic or difficult will be treated in more detail and distinct examples will be solved. c) Diferent bibliographic references will be proposed.
Seminars	a) exercises and problems that will be previously at disposal of the students in the page web will be solved. b) Doubts and concepts of difficult understanding will be clarified. c) Problems of the bulletins that student have to solve by themselves may be proposed.

Personalized attention

Methodologies	Description
Seminars	Bulletins of questions and problems to be solved by the students will be proposed, and in case of neccessity, students may attend to personal tutories to clarify concepts and help them with their resolutions.
Master Session	Concepts related with the master session will be asked to the students. In case to need it students may attend to personal tutories to clarify concepts and help them with their resolutions.

Tests	Description
Short answer tests	Questions will be asked to the students and in case to need it, students may attend to personal tutories to clarify concepts and help them with the resolutions.

Troubleshooting and / or exercises	Problems will be asked to the students and in case to need it, students may attend to personal tutories to clarify concepts and help them with the resolutions.			

Assessment

	Description	Qualification	Training and Learning Results	
Master Session	Answers to concepts seen in the master session	0		
Seminars	Realisation of exercises of individual form or in group and assistance	10	C23	D1 D4 D5 D6 D7 D9 D12 D14
Short answer tests	1ª announcement. a) Three short written proofs (will eliminate matter until the 2ª announcement). b) In June a final examination to recover the matter or to raise qualifications will be done in a complete examination.	30	C23	D1 D3 D6 D7 D9 D12 D14
Troubleshooting and / or exercises	1ª announcement: a) Three short written proofs (will eliminate matter until the 2ª announcement). b) In June a final examination to recover the matter or to raise qualifications will be done.	60	C23	D1 D3 D6 D7 D9 D12 D14

Other comments on the Evaluation

- If the student does not have note any in the different sections will consider No Presented, NP.

- July: Evaluation of the second announcement.
a) It will keep the note of the first corresponding announcement to the seminars and master session.
b) The student will be able to do an only proof written on the contents of the complete matter

Sources of information
Basic Bibliography
Young H.D., Freedman R.A., **Física universitaria, con física moderna, Vol.2**, Pearson Educación, 2013
Tipler, P.A., Mosca G., **Física para la ciencia y la tecnología (Vol. 2)**, Reverté, 2010
Gettys, E.; Kéller, F.J. y Skove, M.J., **Física Clásica y Moderna.**, McGraw-Hill, 2010
Complementary Bibliography
Serway, R.A; Beichner R. J., **Física para Ciencias e Ingeniería**, McGraw-Hill, 2010
Lea S.M.; Burke J.R., **Física. La naturaleza de las cosas**, Paraninfo, 2010
Fleisch, D., **A student's guide to Maxwell's equations**, Cambridge University Press, 2008

Recommendations
Subjects that continue the syllabus
Chemistry, physics and geology: Integrated laboratory II/V11G200V01202
Physics III/V11G200V01301

Subjects that are recommended to be taken simultaneously
Mathematics: Mathematics II/V11G200V01203
Chemistry, physics and geology: Integrated laboratory II/V11G200V01202

Subjects that it is recommended to have taken before
Physics: Physics I/V11G200V01102
Mathematics: Mathematics I/V11G200V01104
Chemistry, physics and biology: Integrated laboratory I/V11G200V01103