



## IDENTIFYING DATA

### Physics: Advanced of physics

Subject	Physics: Advanced of physics			
Code	001G041V01202			
Study programme	(*)Grao en Ciencia e Tecnoloxía dos Alimentos			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	2nd
Teaching language	Spanish			
Department				
Coordinator	Troncoso Casares, Jacobo Antonio			
Lecturers	González Salgado, Diego Troncoso Casares, Jacobo Antonio			
E-mail	jacobotc@uvigo.es			
Web	http://www.faitic.uvigo.es			
General description	In the first year of this degree, present the fundamental knowledges of necessary Physics for a better understanding of the rest of specific matters of the Degree. Taking into account, the diversity of people that accesses to this degree, this course will allow to homogenise the level of knowledges of the students.			

The subject Extension of General Physics is a matter of Basic Training that consists of 6 credits \*ECTS. In her, it enters to the student in the basic appearances of the Thermodynamics and the Electromagnetism with a perspective focused to the environmental alimentary/ field, with technological character. On the other hand, in this course consolidates the training of the student in the handle of the scientific method with the object that it purchase the basic tools for a rational analysis of the nature.

## Competencies

Code	
A3	(*)Que os estudantes teñan a capacidade de reunir e interpretar datos relevantes (normalmente dentro da súa área de estudo) para emitir xuízos que inclúan unha reflexión sobre temas relevantes de índole social, científica ou ética.
A4	(*)Que os estudantes poidan transmitir información, ideas, problemas e solución a un público tanto especializado coma non especializado.
B1	Que los estudiantes sean capaces de desarrollar habilidades de análisis, síntesis y gestión de la información para contribuir a la organización y planificación de actividades de investigación en el sector alimentario.
B2	Que los estudiantes sean capaces de adquirir y aplicar habilidades y destrezas de trabajo en equipo, sean o no de carácter multidisciplinar, en contextos tanto nacionales como internacionales, reconociendo la diversidad de puntos de vista, así como el peso de las distintas escuelas o formas de hacer.
C2	(*)Coñecer os fundamentos físicos, químicos e biolóxicos relacionados cos alimentos e os seus procesos tecnolóxicos
D1	
D3	(*)Capacidade de comunicación oral e escrita tanto na lingua vernácula como en linguas estranxeiras
D4	
D5	
D9	

## Learning outcomes

Expected results from this subject	Training and Learning Results		
Motivation for autonomous learning			D4
Acquisition of critical thinking	A3		D1
Ability to synthesize and analyze information		B2	D5
Ability for presenting the work orally and in writing.	A4		D3 D9
Knowledge about foundations of Thermodynamics and Electromagnetism	A3	B1	C2

<b>Contents</b>	
Topic	
SUBJECT 1. TEMPERATURE	1.1. Scale of temperature Celsius and Fahrenheit 1.2. Thermometers of gas and scale of absolute temperatures 1.3. Thermal dilatation 1.4. Law of the ideal gases 1.5. Equation of Van der Waals and liquid-vapor isotherms 1.6. Diagram of phases
SUBJECT 2. HEAT And FIRST PRINCIPLE OF THE THERMODYNAMICS	2.1. Thermal capacity and specific heat 2.2. Changes of phase and latent heat 2.3. Transfer of thermal energy 2.4. The first principle of the Thermodynamics 2.5. Internal energy of an ideal gas 2.6. Work and the diagram pV for a gas 2.7. Adiabatic quasistatic expansion of a gas
SUBJECT 3. SECOND PRINCIPLE OF THE THERMODYNAMICS	3.1. Machines and thermal engines and the second principle of Thermodynamics 3.2. Refrigerators and the second principle of the Thermodynamics 3.3. Equivalence between thermal machine and refrigerator statements. 3.4. The Carnot machine. 3.5. The heat pump. 3.6. Entropy and disorder 3.7. Entropy and probability
SUBJECT 4. FIELD AND ELECTROSTATIC POTENTIAL IN VACUUM	4.1. Forces between charges: Coulomb Law. 4.2. Electrostatic field. 4.3. Gauss Law. 4.4. Electrostatic potential. 4.5. Electrical dipole: field and potential.
SUBJECT 5 ELECTROSTATIC FIELD IN THE MATTER	5.1. Field and potential in charged conductors. 5.2. Capacity of a conductor. Capacitors. Dielectric constant 5.3. Polarisation and electrical displacement. 5.4. Electrostatic energy.
SUBJECT 6 CONTINUOUS CURRENT	6.1. Intensity and density of current. Equation of continuity. 6.2. Ohm Law. Resistance and conductivity. 6.3. Electromotive force. Generalised Ohm Law. 6.4. Joule Law . 6.5. Kirchhoff Law.
SUBJECT 7 FORCES AND MAGNETIC FIELDS. ELECTROMAGNETIC INDUCTION	7.1. Forces between currents. 7.2. Magnetic induction: Law of Biot and Savart. 7.3. Forces over charges in movement. 7.4. Moment on a spire. 7.5. Fundamental equations of the Field. Theorem of Ampère. 7.6. Laws of Faraday and of Lenz. 7.7. Mutual induction and autoinduction. 7.8. Magnetic energy.

<b>Planning</b>			
	Class hours	Hours outside the classroom	Total hours
Master Session	28	84	112
Seminars	14	24	38

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

<b>Methodologies</b>	
	Description
Master Session	Explanation of the theoretical foundations. Presentation of the theory of the matter by the lecturer. The classes of theory will give mainly using the expositive method combined with the dialectic one to be able to develop the program in his whole.
Seminars	Before giving the seminar classes, the students have a list of exercises and questions in FAITIC for each subject, with the aim of they can think about the exercises before they will carry out them in the seminar hours. This is done in order to get an active participation of each student, and boost his/her rational spirit.

<b>Personalized attention</b>	
Methodologies	Description

Master Session	In the master classes as well as in the seminar, the needs and queries of the students related with the subject will be responded, giving them orientation, support and motivation for the learning process. This will be done in the classroom as well as in the tutoring hours at the lecturer's office.
Seminars	In the master classes as well as in the seminar, the needs and queries of the students related with the subject will be responded, giving them orientation, support and motivation for the learning process. This will be done in the classroom as well as in the tutoring hours at the lecturer's office.

<b>Assessment</b>						
	Description	Qualification	Training and Learning Results			
Master Session	An exam, which is a testing set, will be done.  Learning outcomes: -Motivation for autonomous learning -Ability to synthesize and analyze information -Knowledge about foundations of Thermodynamics and Electromagnetism	70	A3 A4	B1 B2	C2	D1 D3
Seminars	Continuous assessment for students who regularly make all proposed activities in class like exercises and questions. Solution of the bulletins, its theoretical questions and exercises in order to the students show their argumentative skills.  Learning outcomes -Acquisition of critical thinking -Ability for presenting the work orally and in writing.	30			C2	D1 D3 D4 D5 D9

### Other comments on the Evaluation

If any student cannot attend to lectures with a good cause, he/she must do the exercises of the bulletin and send them to the lecturer.

Exam dates:

Final year: October 2, 16:00 h.

1st Edition: May 27, 10:00 h.

2nd Edition: July 15, 10:00 h.

### Sources of information

P. A. Tipler, **Física para la Ciencias y la Tecnología vol.1,**

P. A. Tipler, **Física para la Ciencias y la Tecnología vol.2,**

### Recommendations

#### Subjects that are recommended to be taken simultaneously

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#### Subjects that it is recommended to have taken before

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