

## 28906 - Physics II

### Syllabus Information

**Academic Year:** 2021/22

**Subject:** 28906 - Physics II

**Faculty / School:** 201 - Escuela Politécnica Superior

**Degree:** 583 - Degree in Rural and Agri-Food Engineering

**ECTS:** 6.0

**Year:** 1

**Semester:** Second semester

**Subject Type:** Basic Education

**Module:**

### 1. General information

### 2. Learning goals

### 3. Assessment (1st and 2nd call)

### 4. Methodology, learning tasks, syllabus and resources

#### 4.1. Methodological overview

The learning process used in this subject is based on the following methodology:

- **Interactive lectures** combining an expositive and a demonstrative method. All the contents explained in the theory classroom will be complemented by the problem-solving. It offers students opportunities to test their ideas and opinions against the ideas and opinions of their peers.
- **Cooperative working** in the laboratory sessions.
- **Autonomous work** of the student, especially regarding the study and comprehension of the theoretical concepts and problem-solving.

#### 4.2. Learning tasks

The learning process designed for this subject is based on the following activities:

- **Lectures**, including exposure to the theory and **problem resolution**. Students will have the content of each lecture as well as the collection of numerical exercises at the beginning of each session. One of the purposes of Physics II is to set the foundations needed for later courses, which have a more direct connection to the Sustainable Development Goals (SDG), particularly targets 7.3 (By 2030, double the global rate of improvement in energy efficiency), 12.2 (By 2030, achieve the sustainable management and efficient use of natural resources), and 13.3 (Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning).
- **Laboratory sessions**, that include the presentation of the report elaborated from the results obtained. These laboratory sessions will take 2 hours, approximately every 15 days. Students will have the content before the session, which includes the practical procedure and the theoretical contents.
- **Tutorials** will monitor the learning process development.

### 4.3. Syllabus

The course will address the following learning tasks:

#### Theory

- UNIT 1. - THERMODYNAMICS
  - Topic I.1. Temperature and Heat. Heat transfers
  - Topic I.2. The First Law of Thermodynamics
  - Topic I.3. The Second Law of Thermodynamics
- UNIT II. - ELECTROMAGNETISM
  - Topic II.1. Electrostatics
  - Topic II.2. Continuous current circuits
  - Topic II.3. Magnetostatics
  - Topic II.4. Electromagnetic field
- UNIT III. - WAVES
  - Topic III.1. Waves in solids and fluids
  - Topic III.2. Electromagnetic waves

#### Practicals

1. Thermal expansion and states of aggregation
2. Calorific energy
3. Multimeter and oscilloscope
4. Ohm's Law and the relationship to resistance
5. Charge and discharge of a condenser

### 4.4. Course planning and calendar

It is estimated that an average student should devote to this subject, 6 ECTS, a total of 150 hours. This time must include both classroom and non-attendance activities. The student must ensure that the dedication is distributed evenly throughout the quarter.

Type activity / Week	1	2	3	4	5	6	7	8	9	10	11	12 (1)	13	14	15	16	17	18	19	20	21	Total	
<i>Synchronous activities</i>																							60
Theory	2	2	2	2	2	2	2	2	2		2		2	2	2	2							28
Problems	2		2		2		2	2	2			4			2	2							20
Lab sessions		2		2		2					2			2									10
Assessment									2														2
<i>Non-synchronous activities</i>																							90
Individual work	4	4	2,5	4	2,5	4	2,5	5	3	6	4	2,5	4	4	2,5	6	6	6	5	5		82,5	
Group work			1,5		1,5		1,5					1,5			1,5								7,5
<b>TOTAL</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>9</b>	<b>9</b>	<b>6</b>	<b>8</b>	<b>8</b>	<b>6</b>	<b>8</b>	<b>8</b>	<b>10</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>150</b>	

(1) Wednesday 27<sup>th</sup> April will have Monday-schedule

### 4.5. Bibliography and recommended resources

- BB** Burbano de Ercilla, Santiago. Física general / Santiago Burbano de Ercilla, Enrique Burbano García, Carlos Gracia Muñoz. 32ª ed. Madrid : Tébar, D.L. 2003
- BB** Burbano de Ercilla, Santiago. Problemas de física general / Santiago Burbano de Ercilla, Enrique Burbano García, Carlos Gracia Muñoz. 26ª ed. Zaragoza : Mira Editores, D.L. 1994
- BB** Física universitaria / Francis W. Sears ... [et al.] ; contribución de los autores, A. Lewis Ford ; traducción, Roberto Escalona García ; revisión técnica, Jorge Lomas Treviño ... [et al.]. 11ª ed. México : Pearson Educación, cop. 2004
- BB** Gettys, W. Edward. Física para ciencias e ingeniería / W. Edward Gettys, Frederick J. Keller, Malcolm J. Skove ; traducción, Luis Arizmendi López, José A. García Sole, Carlos E. Zaldo Luezas ; revisión técnica, Ángel Hernández Fernández, Sergio Saldaña Sánchez, María del Carmen Enriqueta Hano Roa. 2a ed. México : McGraw Hill Interamericana, cop. 2005
- BB** TIPLER, P. A. et al. Física para la ciencia y la tecnología. 6ª ed., 1ª reimp. [s. l.]: Reverté, 2011. ISBN 9788429144277.
- BB** Tipler, Paul A. Física para la ciencia y la tecnología. Vol. 1, Mecánica, oscilaciones y ondas, termodinámica / Paul A. Tipler, Gene Mosca ; [coordinador y traductor José Casas-Vázquez ; traductores Albert Bramon Planas ... et al.]. 6ª ed. Barcelona : Reverté, D.L. 2010
- BB** Tipler, Paul A. Física para la ciencia y la tecnología. Vol. 2, Electricidad y magnetismo, luz / Paul A. Tipler, Gene Mosca ; [coordinador y traductor José Casas-Vázquez ; traductores Albert Bramon Planas ... et al.]. 6ª ed. Barcelona : Reverté, D.L. 2010 [available in English]
- BC** González, Félix A. La física en problemas / Félix A. González. Nueva ed. actualizada. Madrid : Tébar Flores, D.L. 2000
- BC** Lleó Morilla, Atanasio. Física para ingenieros / Atanasio Lleó Madrid [etc.] : Mundi-Prensa, 2001
- BC** Serway, Raymond A. Física para ciencias e ingeniería / Raymond A. Serway, Robert J. Beichner. 5ª ed. México [etc.] : McGraw-Hill, cop. 2002

#### LISTADO DE URLs:

Franco, A. (2006). Curso interactivo de Física en Internet. Universidad del País Vasco  
[<http://www.sc.ehu.es/sbweb/fisica/default.htm>]

Franco, A. (2015). Física para las energías renovables. Nuevo curso interactivo. Universidad del País Vasco  
[<http://www.sc.ehu.es/sbweb/fisica3/>]

García, L.I. (2015). FisquiWeb. Espacio web dedicado a la enseñanza de la Física y de la Química. Dpto. De Física y Química del IES Juan A. Suanzes  
[<http://fisquiweb.es/>]

Recopilación clasificada de enlaces de física en Internet  
[<http://www.galeon.com/filoesp/ciencia/fisica/index.htm>]

The updated recommended bibliography can be consulted in:  
<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=28906>