

28901 - Physics I

Syllabus Information

Academic Year: 2020/21

Subject: 28901 - Physics I

Faculty / School: 201 - Escuela Politécnica Superior

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

ECTS: 6.0

Year: 1

Semester: First semester

Subject Type: Basic Education

Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

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 exposition** 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 of the theory and **problems resolution**. Students will have the content of each lecture as well as the collection of numerical exercises at the beginning of each session.
- **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.

- **Individualized tutoring** will monitor the learning process development.

4.3.Syllabus

The course will address the following topics:

- UNIT I: STATICS
 - Topic I.1. Introduction to vector calculation.
 - Topic I.2 Introduction to Mechanics.
 - Topic I.3 Statics of the particle. Equilibrium of the rigid solid.
 - Topic I.4. Shared forces: centres of gravity and moments of inertia of areas.
 - Topic I.5. Analysis of structures.
 - Topic I.6. Dry friction.
- UNIT II: DYNAMICS
 - Topic II.1. Kinematics of particles.
 - Topic II.2. Kinetics of particles. Method of the energy of moments.
 - Topic II.3. Dynamics of rotation of the rigid solid.
- UNIT III: MECHANICS OF SOLIDS AND FLUIDS
 - Topic III.1. Elasticity.
 - Topic III.2. Statics of fluids.
 - Topic III.3. Dynamics of fluids.

Programme of practicals

- Practical 1.- Statics
- Practical 2.- The simple pendulum and the torsion pendulum
- Practical 3.- Elasticity: Hooke's Law and Young's modulus
- Practical 4.- Measurement of densities and viscosities
- Practical 5.- Physical properties of liquids

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 ⁽¹⁾	7	8	9	10 ⁽²⁾	11	12	13	14	15	16	17	18	19	20
Presential activity																				
Theory	2	2	2	2	2		2	2	2	2	2	2	2	2					2	
Problems	2	2	2		2	2	2	2				2	2					2		
Laboratory sessions				2		2			2		2			2						
Evaluation									2											
Non presential work																				
Individual work	4	4	4	4	2,5	4	2,5	4	2	4,5	4	2,5	4	4	2,5	4	6	6	6	
Team work					1,5		1,5			1,5		1,5			1,5					
TOTAL	8	8	8	8	8	8	8	8	8	8	8	8	8	8	4	4	8	8	6	

⁽¹⁾ On 21th October 2020 (Wednesday), the schedule for Monday will apply

⁽²⁾ On 19th November 2020 (Thursday), the schedule for Tuesday will apply

4.5.Bibliography and recommended resources

- BB** Beer, Ferdinand P.. Mecánica vectorial para ingenieros. Dinámica / Ferdinand P. Beer, E. Russell Johnston, jr., Phillip J. Cornwell ; revisión técnica, Miguel Ángel Ríos Sánchez, Felipe de Jesús Hidalgo Cavazos . 9ª ed. México D. F. : McGraw-Hill/Interamericana, cop. 2010
- 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** Mecánica vectorial para ingenieros. Estática / Ferdinand P. Beer ... [et al.] ; revisión técnica, Javier León Cárdenas, Hidalgo Cavazos . 9ª ed. México D. F. : McGraw-Hill/Interamericana, cop. 2010
- BB** Meriam, J.L.. Mecánica para ingenieros. [Volumen I], Estática / J.L. Meriam, L.G. Kraige . 3a. ed. en español. Barcelona [etc.] : Reverté, cop. 1998
- BB** Meriam, J.L.. Mecánica para ingenieros. [Volumen II], Dinámica / J.L. Meriam, L.G. Kraige . 3ª ed. en español. Barcelona [etc.] : Reverté, D.L. 1998
- BC** 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
- 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** Nelson, E. W.. Mecánica vectorial : estática y dinámica / E. W. Nelson , Charles L. Best, W. G. McLean ; traducción y revisión técnica, Mª Rosa Dalmau, José Vilardell Madrid [etc.] : McGraw-Hill/Interamericana, 2004
- BC** Serway, Raymond A.. Física para ciencias e ingeniería / Raymond A. Serway, Robert J. Beichner . - 5ª ed. México [etc.] : McGraw-Hill, cop. 2002
- BC** 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

LISTADO DE URLs:

Física con ordenador. Curso Interactivo de Física en Internet

[<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=28901>