

Course guide 220004 - F1 - Physics I

Last modified: 02/04/2024

Unit in charge:	Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit:	748 - FIS - Department of Physics.
Degree:	BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject). BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Compulsory subject).

Academic year: 2024 ECTS Credits: 6.0 Languages: Catalan

LECTURER

Coordinating lecturer: JUAN CARLOS CAÑADAS LORENZO

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. Understanding and mastery of basic concepts about the general laws of mechanics, thermodynamics and electromagnetism fields and waves and their application to solving problems in engineering.

Transversal:

2. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.

Basic:

CB01-GRETA. That students have demonstrated knowledge and understanding in a field of study that part of the basis of general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes some aspects that involve knowledge of the forefront of their field of study.

TEACHING METHODOLOGY

There will be theoretical lessons, developed in big group classes. The teacher will briefly introduce the general objectives of the chapter. After that, and with the aid of practical problems, the student will be leaded into active participation. The support material will be found in ATENEA: objectives, concepts, examples, evaluable activities and bibliography.

There will also be problem lessons, with smaller groups and laboratory practices where the basic concepts of scientific methodology will be introduced including the concept of scientific approximation. The size of the laboratory groups will be small and there will be a part of the laboratory that is going to have to be done outside it, individually or in groups.

LEARNING OBJECTIVES OF THE SUBJECT

Give comprehension and control of basic concepts of physics, especially mechanics. Give comprehension and control of basic concepts of algebra and vector calculus. Give comprehension and control of basic concepts of particle and solid kinetics in plain movement. Give comprehension and control of basic concepts of particle and solid dynamic laws. Basic knowledge of fluid statics.



STUDY LOAD

Туре	Hours	Percentage
Hours large group	32,0	21.33
Hours medium group	14,0	9.33
Hours small group	14,0	9.33
Self study	90,0	60.00

Total learning time: 150 h

CONTENTS

1.Vector and scalars

Full-or-part-time: 20h Theory classes: 3h Practical classes: 1h Laboratory classes: 4h Self study : 12h

2. Kinetics and dynamic of the particle and systems of particles.

Full-or-part-time: 75h Theory classes: 18h Practical classes: 8h Laboratory classes: 4h Self study : 45h

3. Solid kinetics and dynamic.

Full-or-part-time: 42h Theory classes: 9h Practical classes: 4h Laboratory classes: 4h Self study : 25h

4. Fluid statics.

Full-or-part-time: 13h Theory classes: 2h Practical classes: 1h Laboratory classes: 2h Self study : 8h



ACTIVITIES

ACTIVITY 1: THEORY SESSIONS

Full-or-part-time: 70h Self study: 42h Theory classes: 28h

ACTIVITY 2: CONTINUOUS EVALUATION

Full-or-part-time: 8h Self study: 4h Theory classes: 4h

ACTIVITY 3: PRACTICAL SESSIONS

Full-or-part-time: 44h Self study: 30h Practical classes: 14h

ACTIVITY 4: STATICS AND DYNAMICS LABORATORY

Full-or-part-time: 24h Self study: 12h Laboratory classes: 12h

ACTIVITY 5: LABORATORY EXAM

Full-or-part-time: 4h Self study: 2h Laboratory classes: 2h

ACTIVITY 6: MID TERM EXAMS

Full-or-part-time: 3h Theory classes: 3h

GRADING SYSTEM

Global mark = 0.35*N1A+0.4*N2A+0.10*NL+0.15*NAC The subject will foresee ways to recover an unsatisfactory mark in the midterm exam The acronyms represent: NL: Laboratory grade. N1A and N2A: First and second midterm exam. NAC: Continuous evaluation mark



EXAMINATION RULES.

If a student doesn't develop any activity it will be graded with a 0.

BIBLIOGRAPHY

Basic:

- Tipler, Paul Allen; Mosca, Gene. Física para la ciencia y la tecnología, vol. 1 [on line]. Barcelona: Reverté, 2010 [Consultation: 17/06/2022]. Available on:

https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=10372. ISBN 9788429144321.

- Riley, W.F.; Sturges, L.D. Ingeniería mecánica, vol. 2, Dinámica. Barcelona: Reverté, 1996. ISBN 8429142568.

- Tipler, Paul Allen; Mosca, Gene. Física para la ciencia y la tecnología, vol. 2 [on line]. Barcelona [etc.]: Reverté, 2010 [Consultation: 17/06/2022]. A vailable on:

https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=10373.

Complementary:

- Ortega Girón, Manuel R. Lecciones de física, vol. 1, Mecánica-1. 8a ed. Córdoba: Departamento de Física Aplicada, Universidad de Córdoba, 1995. ISBN 8440442904.

- Serway, Raymond A. Física. 3a ed. Madrid: International Thomson, 2003. ISBN 8497321685.

- Ohanian, H.C.; Markert, J.T. Física para ingeniería y ciencias. 3a ed. México: Mc Graw-Hill, 2009. ISBN 9789701067444.

- Beer, Ferdinand Pierre [et al.]. Mecánica vectorial para ingenieros, vol. 1, estática [on line]. 11ª ed. México: McGraw-Hill, 2017 [Consultation: 08/03/2023]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB BooksVis?cod primaria=1000187&codigo libro=8077. ISBN 9781456255275.

RESOURCES

Hyperlink:

- http://atenea.upc.edu/moodle/. Campus Digital
- http://aransa.upc.es/. Aransa
- http://www.ehu.es. EHU