Course guides
370602 - FÍSICA - Physics

Last modified: 14/07/2020

Unit in charge: Terrassa School of Optics and Optometry
Teaching unit: 731 - OO - Department of Optics and Optometry.

Degree: BACHELOR'S DEGREE IN OPTICS AND OPTOMETRY (Syllabus 2009). (Compulsory subject).

Academic year: 2020 **ECTS Credits:** 7.5 **Languages:** Catalan

LECTURER

Coordinating lecturer: JOSEP PLADELLORENS MALLOFRE - NURIA LUPON BAS

Others:

PRIOR SKILLS

As will be seen later in the section of content, the course has a very basic character. This makes the knowledge necessary for proper use are minimal. Any student who was not connected to a Degree in Optometry will be able to complete the course with profit.

Having the knowledge taught in high school Physics and Mathematics to help track more comfortable on the course.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. Understanding the physical basis of the behavior of fluids and the nature, generation and propagation of light, to understand their role in their own processes and applications of optics and optometry.
2. Being able to take, treat, represent and interpret experimental data. "Use basic laboratory equipment and techniques"

Generical:
3. Adaptation of all the fields of professional activity envers compatible aspects with the medium ambient (recycling, reuse of the materials,...)
4. Capacity to assume different roles within the team, leadership, coordination with other members
5. Extract the main points of a text or any source of information (oral or written)
6. Flexibility to integrate into dynamic environments, multidisciplinary and multicultural.
7. Synthesize and organize information to convey it effectively orally and / or written
8. Working with evidence, methodology and rigour.

TEACHING METHODOLOGY

The planned videos in activity 2 consist in presenting issues by the professors, logically structured information according to criteria appropriate to the course objectives described above.

In solving problems in the planned activity 3, asks students to develop appropriate solutions or through the correct exercise routines, the application of formulas or algorithms, the application procedures for processing information available and the interpretation of results.

As for the preparation of the not attendance folder the realization of practical laboratory under activities 4 and 5, students are asked to intensive analysis of a specific physical situation in order to meet it, interpret it, solve it, generate hypotheses, comparing the data, reflecting on them, complete their knowledge, or predict it. The second of the activities carried out work in groups of 3 (preferably) to 4 members with the aim to incorporate generic skills related to teamwork. In addition, the lab can develop basic instrumental skills, as well as the students started the application of scientific method in solving specific experimental problems.

In all cases you can use support material in the form of detailed syllabus by ATENEA: learning objectives for the content, concepts, examples, programming and evaluation activities of learning and literature.

LEARNING OBJECTIVES OF THE SUBJECT

With the course aims to:
- Briefly review the basic concepts of mechanics as part of the language of physics that are used throughout the course.
- To understand the physical basis of the behavior of fluids and surface phenomena, the physical quantities necessary to do so, the main laws that relate.
- Introduce wave phenomena based on oscillations and mechanical waves.
- To study them one-dimensional mechanical waves: generation, propagation medium changes, mathematical description, overlapping, energy and intensity. Generalize these concepts to 2D and 3D case.
- Enter the electric and magnetic fields to reach the electromagnetic field and electromagnetic waves.
- Studying the interaction force between electric charges, and to deepen the concept of electric field in the electrostatic case.
- Explain the main phenomena related to the magnetic field and the experimental laws that describe them: magnetic force and magnetic field generation.
- Describe the electromagnetic waves only in the case of plane waves and harmonics.
- To present different measurement instruments through their manipulation in the laboratory.
- To introduce students to the scientific method in what concerns the interpretation of experimental data and graphs.

STUDY LOAD

Type	Hours	Percentage
Self study	105,0	56.21
Hours medium group	53,3	28.53
Hours small group	21,8	11.67
Guided activities	6,7	3.59

Total learning time: 186.8 h

CONTENTS

1. MECHANICS. BASIC NOTIONS

Full-or-part-time: 15h
Self study : 15h

2. MECHANICS OF SOLIDS AND FLUIDS

Full-or-part-time: 24h 30m
Self study : 24h 30m

3. OSCILLATIONS AND WAVES

Full-or-part-time: 49h 15m
Self study : 49h 15m

4. ELECTROMAGNETISM

Full-or-part-time: 49h 15m
Self study : 49h 15m

5. LABORATORY

Full-or-part-time: 49h 30m
Laboratory classes: 49h 30m

ACTIVITIES

(ENG) 1. FAMILIARIZACIÓN CON LA PLATAFORMA ATENEA

Full-or-part-time: 6h
Self study: 6h

(ENG) 2. VISUALIZACIÓN DE VÍDEOS EXPLICATIVOS

Full-or-part-time: 21h
Self study: 21h

(ENG) 3. RESOLUCIÓN DE PROBLEMAS

Full-or-part-time: 65h
Self study: 65h

(ENG) 4. PREPARACIÓN DE LA CARPETA NO PRESENCIAL

Full-or-part-time: 24h
Self study: 24h

(ENG) 5. REALIZACIÓN DE LAS PRÁCTICAS

Full-or-part-time: 10h
Self study: 10h

GRADING SYSTEM

Fortnightly tests: conceptual and numerical Quiz (6 along the course) 10%
Problems: solving problems "on line" 10%
laboratory notebook: exercises and questions on experimental simulations 10%
Lab: Attendance sheet preparation and delivery + 10% delivery of results
Final Exam: Problem (2) + test questionnaire (concept) 60%

EXAMINATION RULES.

The activities 2 and 3 are evaluated in 6 tests scheduled fortnightly quizzes and final exam.

The activity 4 consists of sets of six assessable exercises to be solved in writing. The set of all of them must be given to the teacher before the start of the first lab session.

The results obtained in the laboratory (activity 5) must be delivered at the end of each practice session, to be evaluated.

BIBLIOGRAPHY

Basic:
- Kane, Joseph W. Física. 2a ed. Barcelona: Reverté, 2000. ISBN 8429143181.
- Hewitt, Paul G. Física conceptual. Mèxic: Pearson Education, 2004. ISBN 9702604478.
- Tipler, Paul Allen; Mosca, Gene. Física per a la ciència i la tecnologia, vol. 1 [on line]. Barcelona [etc.]: Reverté, 2010 [Consultation: 28/05/2020]. Available on: http://www.ingebook.com/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=6536. ISBN 9788429144321.
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Complementary:
- Cutnell, John D. Física. Mèxic: Limusa, 1998. ISBN 9681851854.
- Gettys, W. Edward. Física para ingeniería y ciencias. 2a ed. Mèxic: McGraw-Hill, 2005. ISBN 9701048938.
- Giancoli, Douglas C. Física para universitarios. 3a ed. Mèxic: Pearson Education, 2002. ISBN 9684444842.
- Alonso, Marcelo. Física. Mèxic: Addison Wesley Longman, 2000. ISBN 9684444265.
- Cromer, Alan H. Física en la ciencia y en la industria. Barcelona: Reverté, 1999. ISBN 8429141561.
- Serway, Raymond A. Física : para ciencias e ingenierías. 6a ed. Madrid: International Thomson, 2005. ISBN 9706864237.