

## Advanced Physics

Academic Year: ( 2023 / 2024 )

Review date: 17-04-2023

Department assigned to the subject: Physics Department

Coordinating teacher: SANTALLA ARRIBAS, SILVIA NOEMI

Type: Electives ECTS Credits : 3.0

Year : Semester :

## REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

PHYSICS

## OBJECTIVES

Students should acquire the fundamentals of Optics. Understanding these basics will allow them in turn to acquire the skills necessary to apply the optical models to simple problems resolution. In particular, those corresponding to wave optics, geometrical optics and quantum optics (light as photons accumulation).

Understand the basics of applications based on optics.

Understand the basic phenomena involved in the interaction of light and matter.

## DESCRIPTION OF CONTENTS: PROGRAMME

0. A brief history
1. Wave motion
2. Electromagnetic waves
3. The propagation of light
4. Geometrical optics
5. Interference and diffraction
6. Polarization
7. Quantum optics

## LEARNING ACTIVITIES AND METHODOLOGY

-In the lectures the theoretical concepts previously described, will be discussed.

- Given the advanced nature of the subject, when methodologically appropriate, problems solving and questions, similar to those of the exams, in order to: Identify the more important Optics and the light-matter interaction laws involved. Analyze the logic of the result obtained: orders of magnitude, relate the most important conclusions to other scientific and technological subjects involved in advanced optics

- Tutorial sessions will be schedule throughout the course, available to students at will. These sessions must be requested in advance

## ASSESSMENT SYSTEM

<b>% end-of-term-examination:</b>	50
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	50

The continuous evaluation consists of two tests, the first for the first four topics and the second for the rest. Each test will be 25% of the final grade.

The final exam will correspond to 50% of the final evaluation.

## BASIC BIBLIOGRAPHY

- E. HECHT, A. ZAJAC OPTICS, Addison Wesley, ultima disponible

#### ADDITIONAL BIBLIOGRAPHY

- GUENTHER, R. Modern Optics, J. Wiley & Sons, N.Y., Más reciente disponible

- R. P. Feynman. The Feynman Lectures on Physics, Millenium Edition. Basic Books, 2010