

26804 - Visual Optics I

Información del Plan Docente

Academic Year	2016/17
Academic center	100 - Facultad de Ciencias
Degree	297 - Degree in Optics and Optometry
ECTS	12.0
Course	1
Period	Annual
Subject Type	Basic Education
Module	---

1. Basic info

1.1. Recommendations to take this course

1.2. Activities and key dates for the course

2. Initiation

2.1. Learning outcomes that define the subject

2.2. Introduction

3. Context and competences

3.1. Goals

3.2. Context and meaning of the subject in the degree

3.3. Competences

3.4. Importance of learning outcomes

4. Evaluation

5. Activities and resources

5.1. General methodological presentation

The overall objective is to understand the functioning of the human eyeball as an optical imaging instrument, as a first important stage of visual perception, and study the quality of the images obtained with it.

To do this we develop, according to their anatomy, schematic eye models within the paraxial Geometrical Optics.

5.2. Learning activities

5.3.Program

Program

0. Historical introduction.
1. Basic concepts and laws of geometrical optics.
2. Optical Representation.
3. Paraxial optics: cardinal elements in centered systems.
4. The human eye as an optical instrument.
5. Imaging in thin systems
6. Correspondence equations in centered systems.
7. Schematic eye models.
8. Imaging and refraction of the eye.
9. Retinal image of an emmetropic eye.
10. Accommodation.
11. Spherical ametropy.
12. Optical compensation of spherical ametropia.
13. Eye astigmatism.
14. Visual acuity.
15. Optical systems with flat surfaces.
16. Ray limitation: aperture and field stops.

Practical sessions

1. Image formation with a positive lens.

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2. Formation of image with negative lens.
3. Refraction through a regular astigmatic lens.
4. Compound systems. Characterization of an optically thick lens.
5. Simulation on an eye on a bench and with VOLT.
6. Simulation of real eye with VOLT.
7. Simulation of ametropies and compensations of a reduced eye on an optical bench.
8. Simulation of ametropies with a digital video camera.
9. Compensation of ametropies with a digital video camera.
10. Simulation of the process of accommodation with a digital video camera.

5.4.Planning and scheduling

5.5.Bibliography and recommended resources

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