

26810 - Visual Optics II

Syllabus Information

Academic year: 2023/24

Subject: 26810 - Visual Optics II

Faculty / School: 100 - Facultad de Ciencias

Degree: 297 - Degree in Optics and Optometry

ECTS: 6.0

Year: 2

Semester: First semester

Subject type: Compulsory

Module:

1. General information

The main objective of the subject is that the student acquires knowledge about colour vision, the analysis of visual adaptations in the sensory and perceptual stage of the visual system, the spatial-temporal aspects of vision and the functioning of binocular vision.

In the context of the Optics module to which the subject belongs, the student must be able to obtain information about the visual system by comparing visual perception and optical parameters of tests measured in the laboratory

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030: Health and wellness; Quality education. In such a way that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement.

It is recommended to have taken and passed the subject Visual Optics I.

2. Learning results

To pass the subject the student must demonstrate the following results:

- To know the optical phenomena involved in vision and their physical limits.
- To characterize the quality of spatial vision.
- To explain the concept of light threshold, as well as the aspects on which it depends.
- To know the basic aspects of colour vision, as well as temporal phenomena.
- To know the basic concepts of binocular vision and the vision of space and shapes.

3. Syllabus

Block I: Theory and problem solving

Topic 1: Visual perception and neural fundamentals

Topic 2: Photometry

Topic 3: Retinal illumination, sensitivity and adaptation to light

Topic 4: Spatial vision

Topic 5: Temporary vision

Topic 6: Colour vision

Topic 7: Binocular vision and depth perception

Topic 8: Pathophysiology of visual pathways and cerebral cortex I

Topic 9: Pathophysiology of visual pathways and cerebral cortex II

Topic 10: Optic neuropathies

Topic 11: Pupillary alterations

Block II: Laboratory practice and scientific seminar

Practice 1: Radiometry, photometry and visual detection thresholds

Practice 2: Optical and visual quality of the human eye

Practice 3: Colour vision, binocular vision and stereopsis

Practice 4: Scientific Seminar

4. Academic activities

- **Participative master class:** 20 hours.

The theoretical contents of the subject will be presented, oriented to the acquisition of basic knowledge about visual perception and binocular vision.

- **Problem solving and case studies:** 15 hours.

Problems will be solved and practical cases applied to theoretical concepts will be analysed.

- **Laboratory practices:** 20 hours.

Acquisition of practical knowledge, skills and abilities in ocular perception and binocular vision.

- **Teaching assignments.** 5 hours.

Preparation of scientific reports of laboratory practices in an autonomous way and in groups. Elaboration of evaluable works.

- **Study and personal work.** 90 hours.
- **Assessment tests.** 4 hours.

5. Assessment system

The subject will be evaluated in the global evaluation mode by means of the following activities:

Theory block (80% of the grade)

- Solution of questions and problems posed in class (10% of the grade).
- Completion of 2 midterm theoretical-practical written tests (70% of the grade), minimum of 4/10 for averaging.

The grade will be obtained as an average of the problems and the two midterm tests, and will constitute 80% of the final grade.

Laboratory practice block (20 % of the grade)

The laboratory practices will be evaluated through the following activities:

- Delivery of reports at the end of each practice (10% of the grade).
- Presentation and final defence of scientific report (10% of the grade).

The grade for the laboratory practices will constitute 20% of the final grade. In order to pass this part of the course, it is essential to attend all the practices.

For students who **have failed or not taken the global evaluation**, the evaluation will be carried out by means of the following activities:

- Objective written test of resolution of theoretical and practical questions (80% of the final grade of the subject).
- Objective laboratory test by performing the experimental setups and writing a report

(20% of the final grade of the subject).