Universidad Zaragoza

Academic Year/course: 2024/25

26832 - Materials for the Optical and Ophthalmic Industry

Syllabus Information

Academic year: 2024/25
Subject: 26832 - Materials for the Optical and Ophthalmic Industry
Faculty / School: 100 - Facultad de Ciencias
Degree: 297 - Degree in Optics and Optometry
ECTS: 6.0
Year:
Semester: First semester
Subject type: Optional
Module:

1. General information

The objective of this subject is the knowledge of the most relevant materials in the development of the professional activity of an optician-optometrist . By studying the relationship between the molecular structure of materials and their chemical, physical and optical properties, it is possible to identify those structural characteristics of the materials that provide the qualities that are desirable in the final product for the user.

The approaches and objectives of this course are aligned with the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (https://sdgs.un.org/goals) as specified in section 6. In this way, the acquisition of the learning outcomes of the course contributes to some extent to their achievement.

2. Learning results

- To know the molecular structure, properties and applications of the most relevant materials used in the optical and ophthalmic industry.
- To know how to relate the structure of a material with the most important properties and qualities of the final product for the user.
- To know different types of treatments that allow modifying the properties of optical materials, especially in the case of ophthalmic lenses and contact lenses.
- To know the manufacturing processes of optical and ophthalmic materials
- To learn about new materials and the most promising trends in ophthalmic treatments.

3. Syllabus

Topic 1. Materials in the optical and ophthalmic industry: overview.

Topic 2. Mineral and organic materials for lens design.

Topic 3. Contact lenses and intraocular lenses.

General properties. Rigid contact lenses, conventional hydrogels and silicone hydrogels. Intraocular lenses.

Topic 4. Treatments and coatings for ophthalmic and contact lenses.

Topic 5. Organic materials for frame design.

Topic 6. Metallic materials for frame design.

Topic 7. Industrial manufacturing technologies.

Topic 8. Organic materials for new ophthalmic treatments.

4. Academic activities

- Master classes (3 ECTS, 30 hours). Presentation and discussion of the contents of the topics.
- Seminars and cases (1.2 ECTS, 12 hours). Proposal of questions and cases related to the syllabus of the subject.

- Academic work (0.8 ECTS, 8 classroom hours). Elaboration of a paper (presentation or poster) on a scientific article related to the contents of the subject.
- Laboratory practices (1 ECTS, 10 hours). Distributed in 2-4 sessions.

5. Assessment system

The evaluation of the subject will be continuous. The evaluation activities (to be assessed out of 10 points) and their contribution to the overall grade are detailed as follows::

A1. Questionnaires (60%). A Moodle quiz will be given at the end of each topic. Multiple choice questions and short questions . The correctness and concreteness of the answers are valued.

A2. Academic work (20%). Preparation, presentation (presentation or poster), and discussion of a group work. The content (correctness and thoroughness) and the answers to the questions asked will be evaluated.

A3. Laboratory practices (20%). Attendance to the practical sessions is mandatory. The correctness of the content of the corresponding reports will be assessed.

In the event that the weighted average of the evaluation activities is lower than 5 or if the student wishes to improve the grade , the student will be able to take the official exams of the subject. The global test will consist of a multiple-choice exam (10 questions) about the syllabus (60%), a theoretical-practical exam (5 short questions) about the practices (20%) and the presentation of an academic work (20%) of similar characteristics to the one done during the term..

It is possible to take a specific part(s) of the overall test. In any case, the highest grade will be considered.

6. Sustainable Development Goals

3 - Good Health & Well-Being
9 - Industry, Innovation and Infrastructure