26832 - Materials for the Optical and Ophthalmic Industry

Información del Plan Docente

Academic Year	2017/18
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

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The methodology followed in this course is oriented to the achievement of the learning objectives. It will help the students to acquire an advance knowledge about the structure and properties of optical and ophthalmic materials through the following teaching and learning tasks: theory sessions, laboratory sessions, academic works or assignments, seminars and classes and, if possible, a guided visit to industry.

During the course, an interactive approach to favour the discussion and to facilitate the comprehension of the main points

of the subject will be taken. Consequently, students are expected to actively participate in the class throughout the semester.

Teaching materials will be available via Moodle. Additional information regarding the course will be provided at the beginning of the course.

5.2.Learning tasks

The course includes 6 ECTS organized according to:

- Theory sessions (3 ECTS): 30 hours

- Classes and seminars (1.2 ECTS): 12 hours

- Laboratory sessions (1 ECTS): 10 hours

- Academic work, assignment (0.8 ECTS): 8 hours

Theory sessions

The lectures (30 h) are designed to provide the students with advanced knowledge about materials used in the optical and ophthalmological industry. The main objectives of each lesson will be highlighted and an interactive environment will be used to discuss and reinforce the lecture contents

Classes and seminars

This activity (12 h) is dedicated to augmentation of the contents presented in lectures, as well as, problem-solving sessions. If possible an applied seminar that includes a visit to industry will be programmed. A very active participation of the students in the sessions will be promoted.

Laboratory sessions

This activity (10h) requires the student to self-study the protocols and instructions for planned experiments before going to the lab. After undertaking the experiments in the chemical lab, the students are also required to elaborate reports that should include the answer to questions about theoretical-practical issues worked during each lab session.

Academic work, assignment

26832 - Materials for the Optical and Ophthalmic Industry

This activity (8 h) requires the student to undertake bibliographic search on a topic that extends the lecture material to elaborate a written report and make a presentation (oral exposition/poster). The tutor will give the student regular feedback on progress. In addition, the project requires the student to construct logical arguments to communicate effectively.

5.3.Syllabus

Theory sessions:

Lesson 1 . Materials for the optical and ophthalmic industry. Overview.

Section I: Organic optical materials

Lesson 2 . Organic materials in lens design. Properties. Thermoplastic and thermoset materials.

Lesson 3 . Biocompatible organic materials: Flexible and rigid. Biomaterials (intraocular). Properties and optical and therapeutic applications.

Lesson 4 . Organic materials in spectacle frame design. Properties. Thermoplastic and thermoset materials.

Section II: Inorganic optical materials

Lesson 5 . Optical mineral materials. Properties. Types of optical glass.

Lesson 6 . Metallic materials.

Section III: Industrial manufacturing processes and treatments

Lesson 7 . Industrial manufacturing technologies. Lathe cutting. Spin casting. Cast molding.

Lesson 8 . Surface treatments and coatings. Lenses: anti-reflective coatings, photochromic coatings, polarized lenses. Contact lenses: tinted contact lenses, reactive dyes, thermally curable inks, multilayer and depth effect.

Section IV: Advances in the use of organic materials for ophthalmic treatments

Lesson 9. Organic materials for new ophthalmic treatments.

Materials for ocular wound repair and treatment. Materials for the development of ophthalmic drug delivery systems.

5.4.Course planning and calendar

For students enrolled in the subject, place and schedule of lectures and examinations will be available on the website https://ciencias.unizar.es/ , and in the page for the course on the platform Moodle at the University of Zaragoza https://moodle2.unizar.es/add/

26832 - Materials for the Optical and Ophthalmic Industry

Submission of projects will be held according to the schedule that will be announced in advance in the page for the course at Moodle. In addition, course materials and readings will be also available on the website for the course.

5.5.Bibliography and recommended resources

BB	Contact lens practice / edited by Nathan Efron . - 1st publ., repr. Edinburgh [etc.] : Butterworth-Heinemann, 2007
BB	Navarro Sentanyes, Antonio. Materiales ópticos inorgánicos / A. Navarro S.. - 5ª ed. Barcelona : [A. Navarro Sentanyes], 2006
BB	Navarro Sentanyes, Antonio. Materiales ópticos orgánicos : monturas y lentes / A. Navarro S. [Barcelona] : A. Navarro Sentañes, D.L. 2007
BB	Navarro Sentanyes, Antonio. Materiales ópticos orgánicos / Antonio Navarro Sentanyes, Manuel Blanco Fernández, Gloria Rico Arnaiz de las Revillas [Barcelona : Los autores], D.L. 1989
BB	Tecnología óptica : lentes oftálmicas, diseño y adaptación / Jesús Caum Aregay ... [et al.] . - 1ª ed. Politecnos Barcelona : Edicions UPC, 2001
BC	Callister, William D., jr.. Introducción a la ciencia e ingeniería de los materiales / William D. Callister, jr ; [versión española por Pere Molera Solà y Marc J. Anglada Gomila] . - [1ª] ed. en español, reimp. Barcelona [etc.] : Reverté, 2007
BC	Fernández Navarro, José María. El vidrio / José María Fernández Navarro . - 3ª ed. Madrid : Consejo Superior de Investigaciones Científicas : Sociedad Española de Cerámica y Vidrio, 2003
BC	López Alemany, Antonio. Lentes de contacto : teoría y práctica / Antonio López Alemany [... et al.] Xà tiva : Ulleye, 2008
BC	Navarro Sentanyes, Antonio. Lentes de contacto y su mantenimiento / [A. Navarro Sentanyes] [Barcelona : s.n.], D.L.

26832 - Materials for the Optical and Ophthalmic Industry

	1999|f(CBS-Impressió Digital)
BC	Shackelford, James F.. Introducción a la ciencia de materiales para ingenieros / James F. Shackelford ; traducción, adaptación y revisión técnica, Alfredo Güemes, Nuria Martín . - 6ª ed., reimp. Madrid [etc.] : Pearson Prentice Hall, 2008