

Course guide

370518 - LENTS - Ophthalmic Lenses

Last modified: 10/06/2021

Unit in charge: Terrassa School of Optics and Optometry
Teaching unit: 731 - OO - Department of Optics and Optometry.

Degree: BACHELOR'S DEGREE IN OPTICS AND OPTOMETRY (Syllabus 2009). (Compulsory subject).

Academic year: 2021 **ECTS Credits:** 6.0 **Languages:** Catalan

LECTURER

Coordinating lecturer: Martinez Roda, Juan Antonio

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. Acquire skills in patient care
2. Understand the different functions that can have glasses: compensation of ametropias, eye protection to general and labour use, low vision aids.
3. Distinguish between the characteristics of materials and designs of various types of ophthalmic lenses (including prisms and filters) and frames, and understand the basic principles of optics and not optical systems used for low vision.
4. Making use of machinery, instruments and tools needed to make assembly, adjustments, repairs and quality control of finished product.
5. Recognize if the glasses meet the standards referred to in ophthalmic optics, optical aids and eye protection.
6. Being able to take, treat, represent and interpret experimental data. "Use basic laboratory equipment and techniques"
7. Value the impact parameters psychoaesthetic, or psychosocial and economic impact to the user.

Generical:

8. Adaptation of all the fields of professional activity envers compatible aspects with the medium ambient (recycling, reuse of the materials,...)
9. Acquire communication techniques appropriate to ensure the success of teamwork
10. Capacity to assume different roles within the team, leadership, coordination with other members
11. Develop empathy with people
12. Judgments (ratings) reports and surveys
13. Encourage methodical work, rigorous, consistent and innovative
14. Reflect and be able to make a critic of the knowledge and developed skills and the level of achievement.
15. Locate new information and the interpretation of it in its context.
16. Working with evidence, methodology and rigour.
17. Value the methods used to achieve the objectives.
18. Value and incorporate technological necessary improvements for the proper development of the profession
19. Assessing the acquisition of the course objectives.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

After the course the student or student should be able to:

- Understand and calculate the geometric parameters, the most important optical and physical characterizing all types of lenses used in ophthalmic and optometric prescriptions relate them to know the properties involved in the adaptation process.
- Understand the physical and chemical properties of the materials used in optics and optometry.
- Understand the processes of selection, design and manufacture of lenses.
- Understand and manage technical analysis, measurement, control and correction of optical systems compensating effects on the visual system, in order to optimize its design and its adaptation.
- To qualify for the calculation of geometric parameters of the visual systems of specific compensation: low vision, intraocular lenses, contact lenses and ophthalmic lenses.
- Know the aberrations of optical systems.
- Make contact with the marketing of products, supply, storage, preservation and information.
- Knowledge and practical application of principles and methods in optics and optometry, as well as the acquisition of skills and competencies described in the general objectives of the title.

STUDY LOAD

Type	Hours	Percentage
Hours small group	32,0	22.86
Hours medium group	24,0	17.14
Self study	84,0	60.00

Total learning time: 140 h

CONTENTS

1. INTRODUCTION. CLASSIFICATION OF OPHTHALMIC LENSES

Description:

This content is worked:

- Different types of ophthalmic lenses classified according to surface geometry
- The functions of the different types of lenses as compensating elements

2. TOOLS WITH SPHERICAL POWER

Description:

This content is worked:

- Geometric and optical parameters that characterize the spherical lens.
- Relations between parameters.
- Exact calculation of spherical lens power.
- Procedures for measuring these parameters. Using frontofocòmetre, spherometer.

3. TOOLS WITH ASTIGMATISM POWER

Description:

This content is worked:

- Description of geometric surfaces.
- Relations between optical and geometric parameters.
- Methods of representation of such lenses.
- Application of slow bicilíndriques. Theorem Stocker
- Procedures for measuring parameters. Handling the lensmeter.

4. LENSES WITH PRISMATIC POWER

Description:

This content is worked:

- Concepts and methods for measuring prismatic power.
- Methods of obtaining a prismatic lens.
- Prentice Law.
- Convention of the bases.
- Prismatic effects achieved by decentralization.

5. BIFOCALS LENSES

Description:

This content is worked:

- Geometry of the bifocal linked to its functionality.
- Concepts of addition, image jump and optical center nearby.

6. LENSES WITH A PROGRESSIVE ADDITION

Description:

This content is worked:

- Description of surfaces.
- Recognition and extraction parameters.
- Advantages and disadvantages on the bifocal lens.

7. ABERRATIONS IN OPHTHALMIC LENSES

Description:

This content is worked:

- Definition and classification of the various aberrations to be considered in an ophthalmic lens.
- Mathematical models for simulation of aberrations linked to lens design.
- Functions for.

8. MANUFACTURING OPHTHALMIC LENSES

Description:

This content is worked:

- Different types of manufacturing processes.
- Cut and polished surfaces with symmetry of revolution around a point or an axis.
- Cutting and polishing of surfaces without symmetry of revolution.
- Surface treatments.

GRADING SYSTEM

- Written test 100%

EXAMINATION RULES.



BIBLIOGRAPHY

Basic:

- Fannin, Troy E. Óptica clínica. 2ª ed. Barcelona: Omega, 2007. ISBN 9788428214223.
- Caum Aregay, J. [et al.]. Tecnología óptica: lentes oftálmicas, diseño y adaptación [on line]. Barcelona: Edicions UPC, 2001 [Consultation: 20/04/2022]. Available on: <http://hdl.handle.net/2099.3/36343>. ISBN 8483014742.
- Jalie, M. The principles of ophthalmic lenses. 4th ed. London: The Association of Dispensing Opticians, 1984. ISBN 0900099208.
- Jalie, Mo. Ophthalmic lenses & dispensing. 3rd ed. Oxford: Butterworth Heinemann, 2008. ISBN 9780750688949.