VNIVERSITAT DE VALÈNCIA

Course Guide
34307 Ophthalmic optics

COURSE DATA

Data Subject	
Code	34307
Name	Ophthalmic optics
Cycle	Grade
ECTS Credits	9.0
Academic year	2018 - 2019

Study (s)

Degree	Center	Acad. year	Period
1207 - Degree in Optics and Optometry	Faculty of Physics	2	Annual

Subject-matter

Degree	Subject-matter	Character
1207 - Degree in Optics and Optometry	14 - Ophthalmic optics	Obligatory

Coordination

Name	Department
ARTIGAS VERDE, JOSE M	280 - Optics and Optometry and Vision Sciences
MARTINEZ CORRAL, MANUEL	280 - Optics and Optometry and Vision Sciences

SUMMARY

Ophthalmic Optics The course aims to study the principles of design and adaptation of ophthalmic lenses for compensation of refractive ametropia, presbyopia and binocular vision anomalies. After studying the principles of Physiological Optics, the student can apply the concepts and eye ametropia theoretical studies to define the different types of optical potential tradeoffs of these problems by using ophthalmic lenses. The student should understand and know the different types of possibilities depending on its geometry and construction characteristics, as well as various business options that can be found on the market. It will be important to know also the different compensation options of presbyopia, as well as methods for evaluating the visual quality obtained with these offsets.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

The student must have knowledge of Geometrical Optics and Physiological Optics

OUTCOMES

1207 - Degree in Optics and Optometry

- To have and to understand the fundamentals of Optometry for its correct clinical and healthcare application.
- Knowing how to apply the knowledge acquired to professional activity, knowing how to solve problems and develop and defend arguments.
- Being able to gather and interpret relevant data to make judgments.
- Being able to transmit information, ideas, problems and solutions to both a specialized and non-specialized audience.
- Development of learning skills necessary to undertake further studies with a high degree of autonomy.
- To know the applicable legislation in professional practice, with special attention to matters of gender equality between men and women, human rights, solidarity, sustainability, protection of the environment and promotion of the culture of peace.
- To know the principles, description and characteristics of the fundamental optical instruments, as well as the instruments used in optometric and ophthalmological practice.
- To know and to calculate the most relevant geometric, optical and physical parameters that characterize all types of ophthalmic lenses used in optometric prescriptions and to know how to relate them to the properties involved in the adaptation process.
- To know the physical and chemical properties of the materials used in optics and optometry.
- To know the processes of selection, manufacture and design of lenses.
- Being able to handle the techniques of centering, adaptation, assembly and manipulation of all types of lenses, an optometric prescription, visual aid and protective glasses.
- To know and to handle the techniques for the analysis, measurement, correction and control of the effects of compensating optical systems on the visual system, in order to optimize their design and adaptation.
- Training for the calculation of the geometric parameters of specific visual compensation systems: low vision, intraocular lenses, contact lenses and ophthalmic lenses.

- To identify and to analyze environmental and occupational risk factors that can cause visual problems.

LEARNING OUTCOMES

- Being able to handle centering techniques, adaptation, assembly and handling of all types of lenses, an optometric prescription, visual aid and protective glasses

- Know and use techniques for analyzing, measuring, correcting and controlling the effects of compensating optics on the visual system, in order to optimize the design and adapt them.

- Training for calculating the geometrical parameters of specific visual compensation systems: low vision, contact lenses and ophthalmic lenses.

- Identify and analyze risk factors and work environment that can cause vision problems

DESCRIPTION OF CONTENTS

1. Monofocal lenses

I. spherical lenses
Principle of spherical ametropia compensation. Classification and characteristics of spherical lenses. Field of view and effectiveness of a spherical lens. Aberrations of spherical lenses.
II .- astigmatic lenses.
The beam astigmatism. Astigmatism compensation. Classification and astigmatic lenses notation. Esferotóricas lenses. Astigmatic lens aberrations.
III .- Other geometries: Aspherical. Aspherical optical surfaces. Parameters aspheric ophthalmic lenses.
IV .- contact lenses. Geometry of the contact lens. Types of contact lenses.
V. - Special lenses (seminars)
- Sunglasses high refractive index. Eye goggles to radiation and mechanical impact ..

2. Multifocal lenses and prisms

VI .- Prisms and prismatic effects.
- Vision with a prism. Power units. Combinations of prisms. Prismatic effects in single-vision lenses. Use of prisms in the compensation and other deviations heterophorias eye. Prismatic imbalances in the monofocal lens mount
VII .- multifocal lenses I: Introduction to the compensation of presbyopia.
- Compensation for presbyopia, the need for the introduction of multifocal lenses. Historical development of the multifocal lens. Bifocal Lenses: types, characteristics and adaptation. Adjustment problems
VIII .- multifocal lenses II: Progressive lenses
- Evolution and Development of the progressive lens. Vision with a progressive lens. Mounting and adjustment. Adjustment problems
IX. Evolution and visual quality monitoring of compensation

- Concepts of optical quality and visual quality. Optical techniques for assessing compensation. Psychophysical techniques for evaluating the visual quality of compensation. Applications monofocal lenses. Applications multifocal lenses. Application in other compensations and corrections
X. - Manufacture of optical elements. (seminars)
- Manufacturing processes of spherical and toric surfaces. Manufacture of multifocal lenses. Surface treatments.

3. Practice practice block

1: Determination of geometric parameters in spherical lenses, radii of curvature, thickness and diameter of the lens.
Practice 2: astigmatic lenses: determination of geometric and optical parameters of astigmatic lenses.
Lesson 3: High Power Lenses positive and negative. Determination of the refractive index of the lens. Determination of aspheric surfaces.
Lesson 4: Study and lensometry management. Measurement of spherical lenses and glasses mounted with spherical lenses
Practice 5: Measurement of astigmatic lenses positioned with frontofómetro not. Optical diagrams.
Practice 6: Measurement of astigmatic lenses positioned with frontofómetro. Optical diagrams.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	45,00	100
Tutorials	30,00	100
Laboratory practices	15,00	100
Attendance at events and external activities	5,00	0
Development of group work	10,00	0
Development of individual work	10,00	0
Study and independent work	75,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	15,00	0
Preparing lectures	5,00	0
Preparation of practical classes and problem	10,00	0
TOTAL	**225,00**	

TEACHING METHODOLOGY

This matter has a highly charged practice, dedicated to the main competition to be acquired at the end of this matter. This will take into account the following methodology:

Live Activities

Lectures:-campus classes (with possible modalities include blended or face) where taught the theoretical matter. They reinforce the use of audiovisual methods, which exemplify more clearly the theoretical and examples to develop.

Small Group Theory sessions: These sessions dedicated to student group work, with proposals of actual cases to be analyzed and studied by the group. Interactivity will be sought through group presentations and classroom examples, made in continuous assessment.

Workshops and visits to industries manufacturing ophthalmic elements.

Practical classes: on-campus classes that will develop the theoretical concepts into practical application in the lens adaptation workshop. These classes are held in small groups of maximum 16 students.

EVALUATION

The practice note will be a 20% mark will

Be held by a final examination in the laboratory. As a requirement to pass the course, you must meet certain minimum and communicated to students prior to examination. Be valued assistance and work practices developed by the student during the course

The note of seminars constitute 30% of the mark will

In each thematic section the student will conduct a seminar work which must be submitted in writing and / or discussed in class. The final grade will correspond to the average of these two works.

Note examinations constitute 50% of the mark will

There will be a midterm exam at the end of each thematic. Each exam will consist of a part of the theory and practices and other developmental problems.

The final grade is the weighted average of the three sections evaluated. To obtain approval will be necessary to obtain a minimum score of 3 out of 10 in each of the sections.

In the second round will be a comprehensive review of the entire subject

REFERENCES

Basic

- Referencia b1: Tecnología Óptica. Lentes Oftálmicas, diseño y adaptación. J.Salvado y M. Fransoy. Ediciones UPC (1997).
  Referencia b2: Lentes Oftálmicas. Problemas. J. Salvado, M. Vera, L. Guisasola y M. Fransoy Ediciones UPC (1997).
  Referencia b3: Problemas de Tecnología Óptica, C. Illueca y B. Domenech .Ed. Universidad de Alicante (1991).
  Referencia b4: Ophthalmic Lenses and dispensing, M. Jalie. Butterworth (2007).
  Referencia b5: Lentes progresivas. Evolución Científica hasta la quinta generación, J. M. Boix y Palación. Editorial Complutense (2000).
  Referencia b6: Óptica Clínica, T. Fannin. Ed. Omega (2007).
  Referencia b7: System for Ophthalmic Dispensing, C. Brooks, I Borish. Elsevier (2006).
  Referencia b8: Essentials of Ophthalmic Lens Finishing, C Brooks. Elsevier (2003).