COURSE DATA

DATA SUBJECT

Code: 34308
Name: Ophthalmic lens assembly and adaptation
Cycle: Undergraduate Studies
ECTS Credits: 9
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1207 - Degree in Optics and Optometry	Facultat de Física	3	Annual

SUBJECT-MATTER

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

COORDINATION

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SUMMARY

The primary objective of this course is to provide basic knowledge of the parameters involved in the proper fitting of an optical prescription. To that end, one must understand the relationship between the user¿s parameters, the frame, and the ophthalmic lenses.

The second objective is to put this knowledge into practice through the practical sessions. In them, students learn in a hands¿on way how to perform the assembly and adaptation of various optical prescriptions, starting with the simplest and progressing to the most complex.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

It is recommended to have taken the course "Ophthalmic optics" in the 2nd year of degree.

COMPETENCES / LEARNING OUTCOMES

1207 - Degree in Optics and Optometry

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

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 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.

To know the physical and chemical properties of the materials used in optics and optometry.

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 the processes of selection, manufacture and design of lenses.

DESCRIPTION OF CONTENTS

1. Theoretical-practical block

- Fitting protocol for ophthalmic lenses and frames according to prescription.
- Relevant factors in taking measurements based on the type of prescription.
- Prismatic prescriptions. Applications.
- Patient tolerances in clinical practice.
- Analysis and resolution of adaptation problems.

2. Mounting and fitting of ophthalmic lenses I

Session 1. Identification of different types of lenses and their characteristics. Marking and centering of lenses. Lens catalogues. Selection of the most appropriate lens for each case.
Session 2. Frame design and parameters. Frame selection criteria. Frame alignment and adjustment. Pupillary measurements (with talc and ruler). Frame measurements (boxing format). Calculation of lens decentration. Minimum lens diameter and pre-edging.
Session 3. Use of software for remote ordering and edging of ophthalmic lenses.
Session 4. Manual mounting of spherical lenses in acetate and/or metal frames. Assembly techniques.
Session 5. Template-based mounting of organic and mineral sphero-cylindrical lenses in acetate and/or metal frames using semi-automatic edgers.
Session 6. Mounting of organic and polycarbonate sphero-cylindrical lenses in acetate and/or metal frames using automatic edger I (with tracer).
Session 7. Mounting of organic and polycarbonate sphero-cylindrical lenses in acetate and/or metal frames using automatic edger II (touchscreen technology).
Session 8. Mounting of bifocal lenses using semi-automatic and/or automatic edgers.
Session 9. Mounting of progressive lenses using semi-automatic and/or automatic edgers.
Session 10. Review of previous practical sessions and submission of exercises.

3. Mounting and fitting of ophthalmic lenses II

Session 11. Mounting of rimless and/or drilled glasses.
Session 12. Other types of mountings.
Session 13. Submission of practical exercises.
Session 14. In-class practical exercise.
Session 15. Review of previous practical sessions.
Session 16. Subject practical exam.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Seminar	5,00
Laboratory	85,00
Total hours	**90,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	5,00
Individual or group project	15,00
Independent study and work	10,00
Preparation of lessons	25,00
Preparation for assessment activities	50,00
Resolution of case studies	30,00
Total hours	**135,00**

TEACHING METHODOLOGY

- Expository lectures delivered by the instructor.
- Interactive classes for presenting student projects and seminars on real cases.
- Laboratory sessions, with a brief theoretical overview followed by practical exercises of progressively increasing difficulty.
- Use of office software tools.
- Use of specialized materials and equipment for conducting laboratory practicals.

EVALUATION

The final grade for the course will be the sum of two parts (A+B):

Part A: Continuous Assessment (30 % of total, 3 points)

- Seminars (20 %, 2 points): attendance and correct completion of all theoretical-practical exercises.
- Laboratory practicals (10 %, 1 point): completion and submission of the report for all lab

exercises.
- Minimum requirement: to pass Part A in the first sitting, students must obtain at least 50 % of its 3 points (almost 1.5 points). This score, once achieved, is carried over to the second sitting.

Part B: Practical Lab Exam (70 %, 7 points)
- Comprising short-answer questions, multiple-choice items, and assembly of monofocal, bifocal, and/or progressive lenses.
- Accuracy in axis marking, spherical power, and toric power will be assessed. Errors greater than 5º in axis marking and/or in the mounting of the axis in either of the two sphero-cylindrical lenses will result in failure of the practical exam. Errors greater than ±0.50 D in the indicated spherical (and/or cylindrical) power of the sphero-cylindrical lens will also result in failure of the practical exam.
- Minimum requirement: to pass Part B in each sitting, students must achieve at least 50 % of its 7 points (almost 3.5 points).

First Sitting
- If a student fails only Part A (score < 1.5 points out of 3), they must sit the second-sitting exam, where Part B will count for 100 % of the grade and will also recover Part A.
- If they fail only Part B (score < 3.5 points out of 7), they may retake only that part in the second sitting, retaining the score obtained for Part A.
- If they fail both parts, the second-sitting practical exam (10 points) will cover and recover both Part A and Part B.

Second Sitting
- The practical lab exam (10 points) replaces all components not passed in the first sitting (theoretical and continuous).

Students who passed Part A in the first sitting retain that score and only need to meet the 50 % minimum in the theoretical part (exam).

REFERENCES

Basic references:

- Salvado J. et al. *Tecnología óptica: lentes oftálmicas, diseño y adaptación.* Edicions UPC - 2001 - ISBN 8483014742

- Benito Galindo A., Villegas Ruiz E.A. *Montaje y aplicaciones de lentes oftálmicas.* Universidad de Murcia - 2001