# COURSE DATA

## DATA SUBJECT

**Code:** 46997
**Name:** Advanced contactology
**Cycle:** Master's Degree
**ECTS Credits:** 4.5
**Academic year:** 2026-27

## STUDY (S)

| Degree | Center | Acad. year | Period |
|---|---|---|---|
| 2280 - Master's Degree in Advanced Optometry and Vision Sciences | Facultat de Física | 1 | First quarter |

## SUBJECT-MATTER

| Degree | Subject-matter | Character |
|---|---|---|
| 2280 - Master's Degree in Advanced Optometry and Vision Sciences | Contactología avanzada | COMPULSORY |

## COORDINATION

LOPEZ ALEMANY ANTONIO

# SUMMARY

The course provides students with the foundations to begin and deepen their knowledge of advanced contact lens fitting for ectatic corneas, such as keratoconus or pellucid marginal degeneration, and following ocular surgery, including refractive surgery and keratoplasty. It addresses the temporary modification of refractive power to compensate for ametropia, myopia progression control using contact lenses, the therapeutic and protective use of lenses on the ocular surface, their interaction with the tear film, and the indications and fitting of prosthetic contact lenses and ocular prostheses.

# 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 that students have a solid foundation in basic contact lens science, including fitting soft and corneal rigid lenses, managing common complications, and understanding care and maintenance protocols.

## COMPETENCES / LEARNING OUTCOMES

### 2280 - Master's Degree in Advanced Optometry and Vision Sciences

Be familiar with different types of reconstructive elements of the orbital cavity and eyeball.

Fit contact lenses in special populations.

Fit optical elements to eliminate or temporarily reduce ocular ametropia.

Fit specially designed contact lenses on the ocular surface, compensating for morphological alterations and avoiding any form of iatrogenesis.

Identify cases of corneal morphological alterations that may benefit from vision improvement with contact lenses.

Know the different orthokeratology lens designs.

Know the different types of artificial corneas, their applications, advantages and disadvantages.

Know the indications for scleral support lenses.

Plan possible prosthetic solutions.

Prescribe a corneal or scleral type contact lens.

Propose temporary compensatory refractive changes to corneal morphology.

Select different types of orthokeratology techniques.

Understand how contact lenses interact with the tear film.

## DESCRIPTION OF CONTENTS

**Topic 1. Contact lenses for corneal shape modification: orthokeratology**
Study of the use of orthokeratology lenses to temporarily reshape the cornea during sleep. Historical development, mechanisms of action, indications, design principles, materials, fitting protocol, topographic follow-up, potential complications, and effectiveness in myopia correction and myopia progression control will be addressed.

**Topic 2. Therapeutic contact lenses**

Study of the therapeutic use of contact lenses to protect the ocular surface, relieve pain, promote healing, and act as vehicles for drug delivery. Materials, mechanisms of action, clinical indications, fitting criteria, and potential complications will be addressed from an advanced clinical perspective.

**Topic 3. Contact lenses after ocular surgery**
Review of contact lens use after ocular surgical procedures, such as corneal refractive surgery, keratoplasty, or cataract surgery. Their functions as ocular bandages, in pain control, the promotion of epithelial healing, and the prevention of complications will be analysed, together with materials, selection criteria, fitting protocols, and postoperative follow-up.

**Topic 4. Contact lenses and the tear film**
Analysis of the interaction between contact lenses and the tear film. The effects of lens material, design, and wear on tear film stability, volume, and composition will be studied, together with their impact on comfort, tolerance, and fitting success, particularly in dry-eye cases.

**Topic 5. Contact lenses in keratoconus**
Study of contact lens options for visual management of keratoconus according to disease stage. The indications, advantages, and limitations of specialty soft, rigid gas-permeable, hybrid, and scleral lenses will be analysed, together with selection criteria, personalised fitting, and clinical follow-up.

**Topic 6. Scleral contact lenses**
Exploration of the clinical use of scleral lenses in advanced corneal conditions and ocular surface disorders, such as dry eye. Design principles, materials, indications, fitting techniques, follow-up, and therapeutic benefits will be addressed, highlighting their capacity to protect the ocular surface, stabilise the tear film, and regularise the cornea.

**Topic 7. Ocular prostheses and artificial corneas**
Study of optical, aesthetic, and reconstructive solutions for anatomical or functional alterations of the anterior segment, the eyeball, and the orbital cavity. The indications for prosthetic contact lenses, ocular prostheses, and different types of artificial corneas will be addressed, including cases of aniridia, leucomas, colobomas, trauma, ocular atrophy, or enucleation. Their applications, materials, advantages, limitations, fitting techniques, and clinical customisation will be studied.

**Practical session 1. Clinical cases of contact lens fitting for myopia control and irregular corneas**
Introduction to the use of specialised clinical instrumentation in advanced contactology. Review of clinical cases focused on rigid contact lens fitting, particularly for irregular corneas—such as keratoconus, post-surgical cases, or other corneal alterations—as well as lens fitting for myopia control.

**Practical session 2. Clinical cases of orthokeratology lens fitting**
Review of orthokeratology treatment cases, assessing corneal topography, lens centration, and refractive response. When patients are available, the initial fitting process will be observed and analysed; otherwise, simulated clinical cases will be used.

**Practical session 3. Clinical cases of contact lens fitting in irregular corneas**
Review of clinical cases involving scleral lens fitting in advanced corneal conditions and ocular surface disorders. Assessment, fitting, and clinical follow-up processes will be analysed.

# WORKLOAD

## PRESENCIAL ACTIVITIES

| Activity | Hours |
|---|---|
| Theory | 14,00 |
| Seminar | 15,00 |
| Laboratory | 15,00 |
| **Total hours** | **44,00** |

## NON PRESENCIAL ACTIVITIES

| Activity | Hours |
|---|---|
| Attendance at other activities | 0,00 |
| Individual or group project | 20,00 |
| Independent study and work | 20,00 |
| Preparation of lessons | 0,00 |
| Preparation for assessment activities | 8,50 |
| Resolution of case studies | 20,00 |
| **Total hours** | **68,50** |

# TEACHING METHODOLOGY

The course combines lectures, seminars, independent work, and clinical practical sessions to foster knowledge acquisition, clinical reasoning, and active student engagement.

**Lectures:**
An expository approach will be used, supported by audiovisual materials, including images, videos, diagrams, and clinical records, to facilitate understanding of the principles, indications, designs, fitting protocols, and follow-up procedures involved in advanced contact lens practice.

**Seminars:**
Students will complete questionnaires, analyse scientific literature, and solve clinical cases related to the course contents. These activities will promote discussion, clinical reasoning, and the application of knowledge to decision-making in advanced contactology.

**Clinical practical sessions:**
Three practical sessions will be held at the UV Optometric Clinic. Students will observe and participate, under staff supervision, in the assessment, fitting, and follow-up of advanced contact lenses, particularly in cases involving myopia control, orthokeratology, irregular corneas, advanced corneal disease, and ocular surface disorders. When suitable patients or live clinical cases are not available, simulated clinical cases, clinical records, and diagnostic images will be used.

**Independent work:**
Students will prepare and review course content, study clinical cases, and complete the proposed academic activities.

## EVALUATION

Assessment will be based on the following components:

- **Final examination: 70% of the final grade.** This will consist of an individual assessment of the theoretical and clinical contents of the course. To pass this component, students must obtain a minimum mark of 5 out of 10, equivalent to 3.5 points out of the 7 points contributed by this component to the final grade.
- **Seminar: 15% of the final grade.** Students will prepare and submit a voice-over PowerPoint presentation on a scientific article related to the course, which will be specified in advance. Assessment will consider understanding of the article, identification of its key points, scientific rigour, and the quality of the presentation. The submission deadline will be communicated at the beginning of the activity.
- **Practical activity: 15% of the final grade.** Students will submit a report on a clinical case addressed during the practical sessions at the Optometric Clinic. The report must provide a structured description of patient care, assessment, clinical decision-making, fitting, and follow-up. The submission deadline will be communicated at the beginning of the activity.

In the **first examination period**, the final grade will be calculated as the weighted sum of the three components. To pass the course, students must obtain a final grade of at least 5 out of 10 and meet the minimum mark required in the final examination.

In the **second examination period**, only the final examination will be recoverable. It will retain a weighting of 70% and the same minimum requirement: 5 out of 10 in the examination, equivalent to 3.5 points out of the corresponding 7 points. The grades obtained for the seminar and practical activity will be retained and will not be recoverable. To pass the course, students must obtain a final grade of at least 5 out of 10 after applying the weighting of all three components.

## REFERENCES

**Basic references:**


- Barnett, M., and Johns, L. K. (eds.). *Contemporary Scleral Lenses: Theory and Application*. Bentham Science Publishers, 2017. ISBN 978-1-68108-567-8.
- Phillips, A. J., and Speedwell, L. *Contact Lenses*. 6th ed. Elsevier, 2019. ISBN 978-0-7020-7168-3.
- López-Alemany, A. (ed.). *Lentes de contacto y superficie ocular: biomateriales*. Ulleye, 2020. ISBN 978-84-122272-1-5.
- Sharma, N., Sah, R., Priyadarshini, K., and Titiyal, J. S. Contact lenses for the treatment of ocular surface diseases. *Indian Journal of Ophthalmology*, 2023, 71(4), 1135-1141.


**Complementary references:**

- López-Alemany, A. (ed.). *Superficie ocular y biomateriales: lentes de contacto*. Ulleye, 2010. ISBN 978-84-937878-3-7.
- Mountford, J., Ruston, D., and Dave, T. *Orthokeratology: Principles and Practice*. Butterworth-Heinemann, 2004. ISBN 978-0-7506-4007-7.
- López-Alemany, A., and Brito Suárez, C. *Cirugía refractiva: soluciones ópticas a sus fracasos*. Ulleye, 2006. ISBN 978-84-930828-4-0.
- Villa-Collar, C. *Atlas de topografía corneal y aberrometría ocular*. Consejo General de Colegios de Ópticos-Optometristas, 2004. ISBN 978-84-933569-4-8.
- Lanca, C., Pang, C. P., and Grzybowski, A. Effectiveness of myopia control interventions: A systematic review of 12 randomized control trials published between 2019 and 2021. *Frontiers in Public Health*, 2023, 11, 1125000.
- Qiu, S. X., Fadel, D., and Hui, A. Scleral lenses for managing dry eye disease in the absence of corneal irregularities: What is the current evidence? *Journal of Clinical Medicine*, 2024, 13(13), 3838.