COURSE DATA

DATA SUBJECT

Code: 34309
Name: Ocular pathology and pharmacology
Cycle: Undergraduate Studies
ECTS Credits: 9
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
1207 - Degree in Optics and Optometry	Facultat de Física	2	Annual

SUBJECT-MATTER

Degree	Subject-matter	Character
1207 - Degree in Optics and Optometry	Ocular pathology and pharmacology	COMPULSORY

COORDINATION

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SUMMARY

The subject of Ocular Pathology and Pharmacology has two parts, one considering the Ocular Pathology and other Ocular Pharmacology

The subject Ocular Pathology is taught during the first semester of the 2nd year. Ocular pathology deals with the diseases of the visual system, and with this perspective it aims to differentiate refractive defects from the rest of the pathological processes that can mimic to these. At the same time, it intends to establish the bases of the different clinical exploratory techniques in order to accurately assess the knowledge of the pathology and the specific degree of response to the different therapies.

The subject Ocular Pharmacology is taught in the second semester of second year in the Degree in Optics and Optometry. Pharmacology is the science that studies the actions and properties of drugs in organisms, understood as drug any chemical used in the treatment, prevention or diagnosis of a disease, or to avoid the appearance of an unwanted physiological process related with ocular pathologies. Bearing in mind this general definition, in Ocular Pharmacology students will first learn the general principles of drug action (general Pharmacology), and will continue with the detailed study of the more important pharmacological groups related with ocular pathologies The basic theoretical knowledge of drugs is complemented with

practical lessons of experimental Pharmacology in the laboratory.

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PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

Students must have acquired knowledge of Anatomy and Physiology to better integrate the global concepts of Ocular Pathology, to finally understand the actions of drugs and their therapeutic effects.

COMPETENCES / LEARNING OUTCOMES

1207 - Degree in Optics and Optometry

Acquire basic skills to handle specialized instruments.

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.

Knowing how to apply the knowledge acquired to professional activity, knowing how to solve problems and develop and defend arguments.

To apply standard psychophysical techniques to characterize anomalous visual systems.

To detect and to assess the main ophthalmological disorders, in order to refer patients to the ophthalmologist for study and treatment.

To have and to understand the fundamentals of Optometry for its correct clinical and healthcare application.

To know and to apply health education techniques and the main generic eye health problems. To know the principles of health and disease.

To know and to apply the procedures and indications of the different methods of clinical examination and complementary diagnostic techniques.

To know how to interpret the results of the measurements taken.

To know some of the most common psychophysical techniques in clinical practice.

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 epidemiological models of the main visual pathologies.

To know the forms of presentation and general routes of administration of drugs.

To know the fundamentals of the latest generation instruments for the diagnosis of ocular pathologies.

To know the general principles of pharmacokinetics and pharmacodynamics.

To know the manifestations of systemic diseases at the ocular level.

To know the manifestations of the pathological processes and the mechanisms by which the main human diseases occur.

To know the most frequent adverse systemic effects after the application of the usual ocular topical drugs.

To know the ocular topical preparations, with special attention to the use of drugs that facilitate the visual and optometric examination.

To know the pharmacological actions, the collateral effects and drug interactions.

To know the properties and functions of the different elements that make up the visual system.

To know the symptoms of visual diseases and to recognize the signs associated with them. To recognize the alterations that modify normal functioning and trigger pathological processes that affect vision.

To recognize the different types of mechanisms and pathophysiological processes that trigger eye diseases.

DESCRIPTION OF CONTENTS

1. Ocular Pathology

I. Introduction. Anatomy and Physiology of the visual system.
II. Pathology of the refractive errors
III. Pathology of the eyelids.
IV. Pathology of the conjunctiva
V. Pathology of the lacrimal system
VI. Pathology of the cornea
VII. Pathology of the lens: cataracts
VIII. Pathology of the intraocular pressure: Glaucoma
IX. Patology of the schlera and uvea
X. Pathology of the vitreous body. Pathology of the retina (retinal detachment)
XI. Vascular pathology of the retina: diabetic retinopathy.
XII. Degenerative diseases of the retina. Age related macular degneration.

XIII. Neurophthalmology (optic pathway and pupillary pathway)
XIV. Neurophthalmologylar (oculomotor palsy)
XV. Neurophthalmology (strabismus and ambliopía)
XVI. Patology of the orbit
XVII. Ocular traumatology
XVIII. Videoysurgery

2. Ocular Pharmacology

Chapter 1. General Pharmacology
1.1. Clinical trials, Pharmacovigilance, Legal normative related with drug management by Optic-optometric graduates
1.2. Pharmacokinetics
1.3. General drug administration. Ocular drug administration.
1.4. Drug mechanism of action
Chapter 2. Midriatic and miotic drugs
Chapter 3. Antiglaucoma drugs
Chapter 4. Antibiótic, antifungical, antiviral and antiprotozoarian drugs
Chapter 5. Antiinflammatory, analgesic y antialergic drugs
Chapter 6. Ocular surface lubricant drugs
Chapter 7. Local Anesthetics drugs
Chapter 8. Anti-ARMD drugs
Chapter 9. Gene Therapy
Chapter 10. Topical Diagnostic agents
Chapter 11. Iatrogeny and ocular sistemic disorders
Chapter 12. Sanitary products used in contact lenses cleaning

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Tutorials	10,00
Theory	65,00
Laboratory	15,00
Total hours	**90,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	5,00
Individual or group project	20,00
Independent study and work	80,00
Preparation of lessons	15,00
Preparation for assessment activities	15,00
Resolution of case studies	0,00

Total hours	**135,00**

TEACHING METHODOLOGY

The subject is designed to facilitate the teaching-learning process and is structured in different classroom activities, coordinated throughout the semester to provide an overview as complete as possible of the developed topic:

* **Theoretical Lessons.**- The students should acquire basic knowledge covered through the lecture's attendance and personal study and effort. In these lessons, the teacher gives an overview of the topic, focusing on the most relevant and complex aspects. To facilitate the activities of personal study and preparation of the issues in depth, the proper literature and necessary support material will be indicated or provided to the students through the Virtual Classroom; will be made available self-correcting questionnaires as well, so they can assess their level of knowledge and understanding of the programme.

* **Clinical and laboratory Practical Lessons.**- Clinical and Laboratory practical lessons are carried out by the corresponding professors of the two topics (Ocular Pathology and Ocular Pharmacology), according to the schedules. In Ocular Pharmacology, these will run through in 2 sessions and will be related to the theoretical aspects of the various pharmacological groups studied in this part. At the beginning of each session, the Professor will point the most important aspects of experimental work and will assist the student during the session. Once the experimental part is carried out, the students will analyze the observed facts and will resolve some issues raised by the teacher at the beginning of the session or during the development of the practical lesson. At the end, students will provide a memory. Respect to Ocular Pathology, the practical classes will run according to the programmed protocols, in relation to the lectures as well as to practical aspects of the ophthalmology, ophthalmic diseases and health and vision care.

* **Tutorials.**- Tutorials are organized in small groups of students, according to the established timetable. In these sessions, the tutor will evaluate the learning process of the students in a global way. The tutor may raise specific issues of greater complexity to the ones undertaken in regular seminars according to the needs of the students either individually or collectively. Besides, the tutorials will serve to solve doubts that might arise during the lectur

EVALUATION

The assessment of student learning will consider all aspects outlined in the methodology section of this guide and will be carried out continuously by the instructor. The assessment will be the same for both sessions.

1) The Pathology section will be assessed as follows:
- 80% of the grade will come from the theoretical exam.
- 10% of the grade will come from the practical work, which requires mandatory attendance.
- 10% of the grade will come from the evaluation of the work completed in theoretical classes and tutorials.

2) The Pharmacology section will be assessed as follows:
- 70% of the grade will come from the theoretical exam. A grade of 4.5 out of 10 on the exam is required for

the practical work and tutorials to be taken into account.
- 10% of the grade will come from practical work, which requires mandatory attendance. Students will submit exercises at the end of the practical sessions, which will be assessed and will be assigned to this part of the grade.
- 20% of the grade will be awarded for group work completed during the tutorial sessions.

The final grade for the course will be calculated based on 60% for the Pathology section and 40% for the Pharmacology section. It is essential to pass each section separately to pass the course. If a student passes a section, the grade for that section will be retained for the second sitting, and only the failed section will need to be retaken.

REFERENCES

Basic

- Kanski. Oftalmología Clínica. 8ª ed. Brad Bowling, Editorial Elsevier, 2016
- Flórez J. (editor). Farmacología humana 6ª ed. Editorial Elsevier
- Masson, 2014. Manual de oftalmología. García-Feijóo, J.; Pablo-Júlvez, L.E. Editorial Elsevier, ISBN: 9788480867214, 2012

Complementary

- Óptica oftálmica. Teoría y problemas. 1ª ed. Iglesias J y Rodríguez A. Editorial ICM, 2019
- Manual práctico de oftalmología para personal sanitario no facultativo. A. Navea, I Llácer, Editorial Fundación Oftalmológica del Mediterráneo, 2016
- Guiones de oftalmología. Aprendizaje basado en competencias 2ª Ed. Maldonado y Pastor J. Editorial Mc Graw Hill, 2011
- Agencia Española de Medicamentos y Productos Sanitarios - AEMPS https://www.aemps.gob.es/