

**COURSE DATA****Data Subject**

Code	34309
Name	Ocular pathology and pharmacology
Cycle	Grade
ECTS Credits	9.0
Academic year	2023 - 2024

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	15 - Ocular pathology and pharmacology	Obligatory

Coordination

Name	Department
DUCH SAMPER, ANTONIO MIGUEL	40 - Surgery
HERRERO CERVERA, M.JOSE	135 - Pharmacology
PINAZO DURAN, MARIA DOLORES	40 - Surgery

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.

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.

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 properties and functions of the different elements that make up the visual system.
- To recognize the different types of mechanisms and pathophysiological processes that trigger eye diseases.
- 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 know and to apply the procedures and indications of the different methods of clinical examination and complementary diagnostic techniques.
- To know the forms of presentation and general routes of administration of drugs.
- To know the general principles of pharmacokinetics and pharmacodynamics.
- To know the pharmacological actions, the collateral effects and drug interactions.
- To know the ocular topical preparations, with special attention to the use of drugs that facilitate the visual and optometric examination.
- To know the most frequent adverse systemic effects after the application of the usual ocular topical drugs.
- To detect and to assess the main ophthalmological disorders, in order to refer patients to the ophthalmologist for study and treatment.
- To know the manifestations of systemic diseases at the ocular level.
- To know the epidemiological models of the main visual pathologies.
- 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 the manifestations of the pathological processes and the mechanisms by which the main human diseases occur.
- To know some of the most common psychophysical techniques in clinical practice.
- To apply standard psychophysical techniques to characterize anomalous visual systems.
- To know the fundamentals of the latest generation instruments for the diagnosis of ocular pathologies.
- Acquire basic skills to handle specialized instruments.
- To know how to interpret the results of the measurements taken.

LEARNING OUTCOMES

- Knowledge of the physico-chemical characteristics of the drugs and understanding of the influence of the human body on them.
- Knowledge and understanding of general principles of the mechanism of action of drugs, bases of drug interactions and adverse reactions related with ocular pathologies.



- Knowledge and understanding of the effects, mechanisms of action, pharmacokinetics, therapeutic indications and contraindications of the most representative drugs that act on ocular pathologies.
- Knowledge of the topical ocular preparations with special attention to those drugs which facilitate visual and optometric evaluation.
- Acquisition of skills in search of information necessary to perform their tasks and to interpretation of results.
- Be able to handle the main eye pathologies, establish its severity and to know the urgency of triggering the protocols for each therapeutical intervention.
- To know and manage ophthalmological techniques for the analysis, measurement, correction and control of ocular pathologies.
- To identify the main treatments usually applied in ophthalmology.

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 degeneration.
- 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. Videosurgery

**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. Antibiotic, antifungal, 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 systemic disorders

Chapter 12. Sanitary products used in contact lenses cleaning

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	50,00	100
Tutorials	25,00	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

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

All aspects set out in the section on methodology of this guide will be considered in the assessment of student learning and you will take place in a continuous manner by the professor.

- **80% of the grade:** will come from the score of the theoretical exam
- **10% of the grade:** will come from the score obtained for practical lessons, which will be compulsory. The score will take into account the participation and performance in the laboratory (60%), as well as the memory (40%). Practical lessons are mandatory and in case a student fails the subject the year that they were taken, the score obtained will be applicable to only the consecutive year.



- **10% of the grade:** will come from the evaluation of the work done and presented in tutorials and theoretical lessons. It is an essential requirement to pass the subject to have taken and passed the practical lessons and the theoretical exam.

Students who do not show the theory exam but have participated in different teaching activities carried out (seminars, laboratory, computer room, tutorial , etc..) will be assessed as not shown in the first round, but still not submitted for consideration by theory, the final grade on the second call will take into account the marks obtained in the various activities and thus may appear as SUSPENSE .

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
- 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

Additional

- Agencia Española de Medicamentos y Productos Sanitarios - AEMPS
<https://www.aemps.gob.es/>