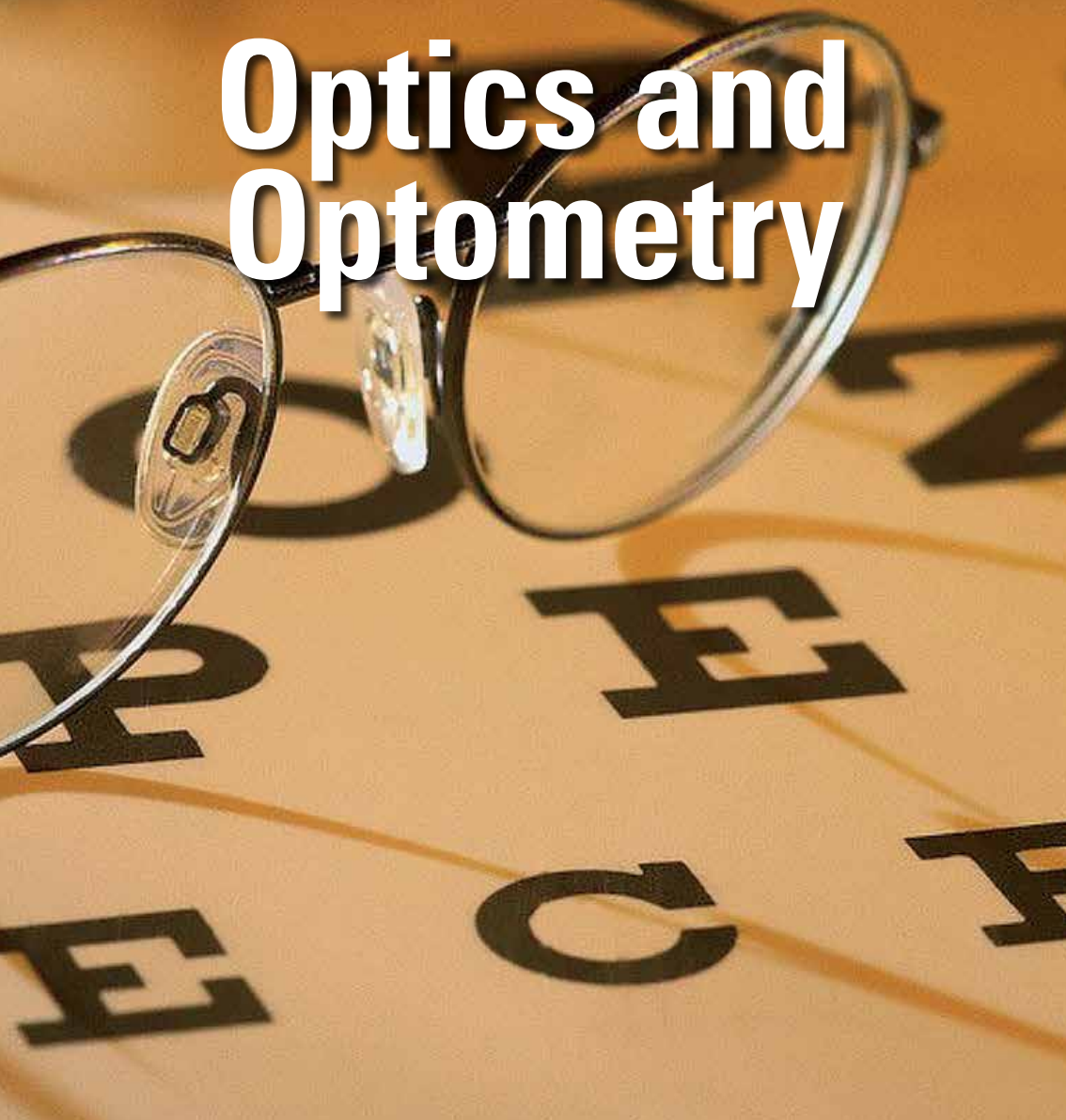


# Bachelor's Degree

Health Sciences



# Optics and Optometry



Complutense University of Madrid



# Syllabus

Type of subject	ECTS
Core Studies	60
Compulsory	126
Elective	30
External Internships	18
Final Year Project	6
<b>Total</b>	<b>240</b>

Year One	ECTS
Human Anatomy	6
Anatomy of the Visual System	6
Biochemistry of the Eye	6
Statistics	6
Geometric Optics	6
Physics	6
Physiological Optics	6
Mathematics	6
Chemistry	6
One Elective	6

Year Two	ECTS
Bio-Ophthalmology: Principles of General and Ocular Physiology	6
Physical Optics I	6
Physical Optics II	6
Optical and Optometric Instruments	6
Ophthalmic Optics I	6
Ophthalmic Optics II	6
Pathophysiology of Eye Diseases	6
Optometry I	6
Optometry II	6
One Elective	6

Year Three	ECTS
Materials in Ophthalmic Optics and Contact Lenses	9
Eye Pathology and Pharmacology	6
Optometry III	6
Optometry IV	6
Optometry V	6
Contact Lenses I	6
Contact Lenses II	6
Visual Perception	9
One Elective	6

Year Four	ECTS
Biomedical Optics	6
Ocular Diagnosis Techniques for Opticians-Optometrists	6
Optometry Practice I	6
Optometry Practice II	6
Two Electives	12
Supervised Internship	18
Final Year Project	6

First Year Electives	ECTS
Introduction to Physics	6

First, Second, Third and Fourth Year Electives	ECTS
Mathematics Extension	6
Drawing Applied to Optics	6
History of Optics	6
Introduction to Scientific English	6

Second, Third and Fourth Year Electives	ECTS
Optic and Optometric Design	6
Lighting	6
English Applied to Optics and Optometry	6
Immunology for Opticians-Optometrists	6
Microbiology for Opticians-Optometrists	6
Vision Neurochemistry	6
Acoustics and Audiometry Techniques	6

Third and Fourth Year Electives	ECTS
Artificial Vision	6
Visual Health and Development	6
Legislation and Professional Ethics for Opticians-Optometrists	6
Basis of Audiology and Audiometry	6
Physiology and Neurobiology of Hearing	6

Year Four Electives	ECTS
Optometry Care in Special Conditions	6
Optic Treatments in Optometry	6

Participation Credits	ECTS
Any course	6

# Knowledge acquired

- Propagation of light in isotropic media, light-matter interaction, light interference, diffraction phenomena, properties of surfaces, single and multiple layers and the principles of the laser and its applications.
- Principles, description and characteristics of optical instruments.
- Major geometric, optical and physical parameters.
- Physical and chemical properties of materials used and selection processes.
- Techniques for centring, adapting, assembling and handling all type of lenses.
- Techniques for analysis, measurement, correction and control of the effects of the compensatory optical systems on the visual system.
- Calculation of geometrical parameters of specific visual compensation systems: low vision, intraocular lenses, contact lenses and ophthalmic lenses.
- Aberrations of the optical systems and fundamentals and laws of radiometry and photometry.
- Ocular parameters and models and factors limiting retinal image quality.
- Space and time aspects of vision.
- Psychophysical tests to determine visual perception levels.
- Properties and functions of the various elements comprising the visual system.
- Pathophysiological mechanisms and processes leading to eye diseases.
- Symptoms and associated signs of eye diseases. Methods of clinical examination and complementary diagnostic techniques.
- General principles of pharmacokinetics and pharmacodynamics. Pharmacological actions, side effects and interactions. Adverse systemic effects.
- Epidemiological models of the main visual pathologies.
- Healthcare education techniques and main general ocular health issues.
- Sensory and oculomotor mechanisms of binocular vision. Anomalies of accommodation and binocular vision.
- Visual therapy programmes. Current eye surgery techniques and eye tests included in pre- and post-operative assessments.

- Optical and non-optical aids for low vision. Properties of the types of contact lenses and ocular prostheses.
- Geometry and physical-chemical properties of contact lenses and ocular and refractive considerations.
- Maintenance solutions, diagnosis and treatment and lenticular and ocular characteristics.
- Controlled modification of the corneal topography with the use of contact lenses and anomalies associated to their use.
- Vision of colours, shapes and movement and functioning of the retina as receptor of radiating energy.
- Changes in perception associated to ageing.
- The nature and organisation of clinical care, patient protocols, visual screening techniques of different populations, legal and psycho-social aspects.
- Fundamentals and techniques of healthcare education and general health programmes. Environmental and occupational risk factors that may cause vision problems.

## Professional opportunities

- Qualified professionals devoted to visual healthcare in primary care and healthcare centres, both public and private.
- Research and teaching in Optics and Optometry.
- Professionals in technical offices in the field of optical engineering: optical design, lighting, colour, bio-optical...





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Grados UCM



### **Faculty of Optics and Optometry**

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For further information: [www.ucm.es/estudios/grado-opticayoptometria](http://www.ucm.es/estudios/grado-opticayoptometria)  
Contents of this brochure is subject to changes

[www.ucm.es](http://www.ucm.es)

