

SUBJECT TEACHING GUIDE

1014 - OPTICAL DESIGN

University Master's Degree in the Science and Engineering of Light

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	University Master's Degree in the Science and Engineering of Light			Type and Year	Compulsory. Year 1
Faculty	School of Industrial Engineering and Telecommunications				
Discipline					
Course unit title and code	1014 - OPTICAL DESIGN				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. FISICA APLICADA				
Name of lecturer	JOSE MARIA SAIZ VEGA				
E-mail	josemaria.saiz@unican.es				
Office	Facultad de Ciencias. Planta: + 2. INVESTIGADORES DEL PROYECTO EUROPEO X244 (2030)				
Other lecturers	MARIA DOLORES ORTIZ MARQUEZ				

3.1 LEARNING OUTCOMES

- Students shall be able to:
- Apply the fundamental of geometrical optics to the design of optical systems.
- Understand the problem of limited fields and apertures and the nature of the solutions.
- Know the main magnitude and units used to describe the light from both the radiometric and photometric points of view.
- Understand and handle the computational tools -a a basic level- used to design and correct the optical systems.

4. OBJECTIVES

- Know and apply the fundamentals of Geometrical Optics to optical systems.
- Understand the problem of limited fields and apertures and the nature of the solutions.
- Know the main magnitude and units used to describe the light from both the radiometric and photometric points of view.
- Understand and handle the computational tools -a a basic level- used to design and correct the optical systems.

6. COURSE ORGANIZATION

CONTENTS	
1	FUNDAMENTALS OF GEOMETRICAL OPTICS -Paraxial optics. -Real systems: limitations and aberrations. -Ray tracing in real systems.
2	OPTICAL INSTRUMENTS -Image formation instruments. -Instruments for near and far vision. -Microscopy. -Paraxial optics instrument design.
3	RADIOMETRY AND PHOTOMETRY -Magnitudes and main equations. -Applications to instruments

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Assessment activities during the teaching time, with the following weights: -Periodic tests (20%) -Exercises (20%) -Laboratory work (10%)	Others	No	Yes	60,00
Seminar and Report. Each student will present a work on an assigned topic (an optical element or instrument) in the form of a report and a seminar.	Work	No	Yes	20,00
Final exam, including theory and practical questions.	Written exam	Yes	Yes	20,00
TOTAL				100,00

Observations

In case that a condition that forces that part of the teaching has to switch to remote-mode, the evaluation will be adapted accordingly.

Observations for part-time students

Part-time students can agree special conditions for the delivery of works and exercises. In case they cannot do the follow-up tests, this part of the mark will add to the final exam. For the lab work, student and supervisor will agree on a date.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

'Óptica', E. Hecht, Addison-Wesley Iberoamericana 3ª Edición, 2000

'Óptica', J. Casas, Librería General, Zaragoza 7ª Edición, 1994