SUBJECT TEACHING GUIDE

1019 - Imaging

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

Academic year 2024-2025

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	1019 - Imaging				
Number of ECTS credits allocated	6	Term		Semester based (1)	
Web	https://moodle.unican.es/				
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. FISICA APLICADA
Name of lecturer	PEDRO JOSE VALLE HERRERO
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Other lecturers	MANUEL PEREZ CAGIGAL

3.1 LEARNING OUTCOMES
- Students analyze optical systems for image formation from the electromagnetic basis of light.
- Students know current techniques about acquisition, storage, processing and analysis of images.
- Students use algorithms to extract the relevant information of images in the contexts of industry and research.
- The student is able to autonomously address problems in the field of image processing and to communicate the results in a useful and efficient way.

4. OBJECTIVES

Understanding the fundamentals of the formation of images and behavior of optical systems within the framework of electromagnetic theory of light.
Ability to calculate and analyze the response of simple optical systems using Fourier techniques.
Know the principles and techniques of acquisition, digitization and storage of images.
Perform basic operations of digital image processing (preprocessing).
Ability to integrate into professional groups or research work requiring knowledge of image processing.

6. SUBJECT PROGRAM

CONTENTS	
1	Electromagnetic theory of optical systems. Optical image processing.
2	Adquisition and storing of digital images. Digital image processing.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Written exam.	Written exam	No	Yes	35,00
Written reports on theoretical, numerical or laboratory tasks.	Work	No	Yes	35,00
Assesement of student work in the course.	Others	No	Yes	20,00
Short student seminars.	Oral Exam	No	Yes	10,00
TOTAL				100,00

Observations
The recoverable assessment will be carried out by repeating the assignments and/or a final exam.
Observations for part-time students
Part-time students may carry out a global assessment of the subject by submitting the continuous assessment exercises and a final exam of the subject.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC
"Introduction to Fourier Optics", J. W. Goodman (McGraw-Hill)
“Digital Image Processing”, R.C. González and R.E. Woods (Prentice Hall)