

SUBJECT TEACHING GUIDE

G1778 - Experimental Optics

Double Degree in Physics and Mathematics
Degree in Physics

Academic year 2021-2022

1. IDENTIFYING DATA			
Degree	Double Degree in Physics and Mathematics Degree in Physics		Type and Year Compulsory. Year 3 Compulsory. Year 3
Faculty	Faculty of Sciences		
Discipline	Subject Area: Physics Laboratories Central Module		
Course unit title and code	G1778 - Experimental Optics		
Number of ECTS credits allocated	6	Term	Semester based (2)
Web			
Language of instruction	English	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	FERNANDO MORENO GRACIA PABLO ALBELLA ECHAVE ANA QUIRCE TEJA		

3.1 LEARNING OUTCOMES

- Ability to carry out experiments involving light generation, free and guided propagation, detection and measurement
- Experimental verification of some of the most important phenomena in optics, including the fundamental laws of propagation, dispersion, polarization, interference and diffraction.
- Familiarity with data interpretation according to theory and error handling with scientific criteria
- Development of oral, and written, communication skills for the description of experimental results

4. OBJECTIVES

Apply the scientific method, critical thinking and experimental rigor.

Understand a fundamental set of phenomena and experimental displays, as well as their main implications in the field of applied optics.

Know how to behave safely and easily in an optics lab, either individually or in group.

Know how to process and analyze the experimental data in a correct way. The student should be able to discuss the results and contrast them with the theoretical models or expected values.

Know how to prepare reports and oral presentations to present his work and results to others.

6. COURSE ORGANIZATION

CONTENTS

1	<p>-Basic instrumental optics. Optical experiments related to: Transverse polarization of electromagnetic waves (generation and analysis), Radiometry Laws, Light dispersion, Color filter characterization, and Digital Image Processing. Theory and fundamentals: Classroom sessions for introductory purposes, Experimental displays shown and explained by the teacher, seminars presented by students.</p>
2	<p>Physical Optics. Optical experiments related to: Time and space coherence, interference with two and multiple beams, diffraction by apertures and gratings, and digital image. Experiments with optical fibers and lasers. Theory and fundamentals: Classroom sessions for introductory purposes, Experimental displays shown and explained by the teacher, seminars presented by students.</p>

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Before leaving the lab, a "results page" with data and conclusions must be handed to the supervisor. The following items are assessed: a) The preparation of the practice. b) The attitude and skills in the lab. c) The results and its analysis. d) The labor	Laboratory evaluation	No	No	30,00
Two written reports will be done, corresponding to two of the experiments done by the student. The maximum length is 8 pages. If deadlines are not met the mark will suffer a penalty.	Work	No	Yes	20,00
Each student will present one of the experiments, with an approximate duration of 15 min.	Oral Exam	No	No	10,00
The format is a True/False test with the main purpose of monitoring the comprehension of the most basic concepts just introduced.	Written exam	No	No	10,00
Question are mainly about the tasks and concepts developed in the lab. No supplementary support will be allowed (books...)	Written exam	Yes	Yes	30,00
TOTAL				100,00
Observations				
Realization of the experiments and attendance to demonstrative sessions is mandatory. As a general criterion, all materials presented after the deadline will be assessed with a grade of 0 (zero), unless authorized by the responsible of the course.				
Observations for part-time students				
Part-time student should inform the person responsible of the course at the beginning of the term				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Guides of the experiments as provided to the students.

E. Hecht, OPTICS, Addison-Wesley Ed