

## SUBJECT TEACHING GUIDE

G32 - Basic Experimental Physics II: Waves: Light and Sound

Double Degree in Physics and Mathematics

Double Degree in Physics and Mathematics

Degree in Physics

Degree in Physics

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Double Degree in Physics and Mathematics Double Degree in Physics and Mathematics Degree in Physics Degree in Physics			Type and Year	Core. Year 1 Core. Year 1
Faculty	Faculty of Sciences				
Discipline	Subject Area: Basic Experimental Physics Basic Module				
Course unit title and code	G32 - Basic Experimental Physics II: Waves: Light and Sound				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Knowledge Field					
Web	<a href="https://aulavirtual.unican.es/">https://aulavirtual.unican.es/</a>				
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. FISICA APLICADA				
Name of lecturer	JOSE MARIA SAIZ VEGA				
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Office	Facultad de Ciencias. Planta: + 2. INVESTIGADORES DEL PROYECTO EUROPEO X244 (2030)				
Other lecturers	PEDRO JOSE VALLE HERRERO FRANCISCO MATORRAS WEINIG				

4. OBJECTIVES	
In summary: to reach the above described results.	
General objectives: [Part 1] Know the fundamentals of mechanical waves, their properties, and effects such as interference or the Doppler effect. Study sound as a wave, and understand a series of devices for its analysis. [Part 2] Know the principles of optics and know how to apply them to a set of systems and instruments, whether related to vision or image formation. [Part 3] Understand the phenomenon of light propagation as a transverse wave, its polarization, the most basic interferential and diffraction phenomena and its application to a couple of devices.	

6. SUBJECT PROGRAM	
CONTENTS	
1	1.- Waves. General concepts. 2.- Wave superposition. 3.- Standing waves. [Laboratory session. Lessons 1-3] 4.- Wave propagation 5.- Sound [Laboratory session. Lessons 4-5]
2	6.- Fundamentals of geometrical optics. 7.- Optical systems. [Experiment: Focal length of a lens] 8.- Light limitation and image quality. [Laboratory session. Lessons 6-8] 9.- The eye and other imaging systems. 10.- Microscopes and telescopes. [Laboratory session. Lessons 9-10]
3	11.- Wave nature of light. Propagation and polarization. 12.- Light interferometry. 13.- Diffraction: Basic phenomena and gratings. [Laboratory session. Lessons 11-13]

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
After a demo session in the lab, carried out by the teacher, students are asked to fill in a short true/false test.	Laboratory evaluation	No	No	20,00
After finishing a lesson, or every two if they are short, students are asked to fill in a short true/false test on questions related to matters discussed in the class.	Written exam	No	Yes	15,00
Students are given exercises to do on their own and give back to the teacher.	Others	No	Yes	15,00
During a lab experiment student's work is assessed in several ways: By questions at the beginning of the session, by observing how the experiment is performed and by revising the results they present immediately after the session.	Laboratory evaluation	No	No	15,00
The final exam is divided in two parts: First (about 1h) is composed of questions and second (about 2h) is composed of exercises.	Written exam	Yes	Yes	35,00
<b>TOTAL</b>				<b>100,00</b>
<b>Observations</b>				
The part of the assessment that is based on the laboratory work is over 1/3 of the total. This evaluation cannot be recovered later. The rest of the evaluation inputs admit re-evaluation, that is done together with the final exam.				
<b>Observations for part-time students</b>				
For part-time students some lab sessions could be adapted to his/her working schedule.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
<b>BASIC</b>
Material didáctico disponible en el Aula Virtual UC.
"FISICA para la ciencia y la tecnologia"; Paul A. Tipler; Ed. Reverte; 4ª Edicion, 2001