

## SUBJECT TEACHING GUIDE

G63 - Physics Laboratory II

Double Degree in Physics and Mathematics  
Degree in Physics

Academic year 2017-2018

1. IDENTIFYING DATA					
Degree	Double Degree in Physics and Mathematics Degree in Physics			Type and Year	Compulsory. Year 2 Compulsory. Year 2
Faculty	Faculty of Sciences				
Discipline	MODULE WITH SECOND COURSE SUBJECTS Subject Area: Physics Laboratories Central Module				
Course unit title and code	G63 - Physics Laboratory II				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. FISICA APLICADA
Name of lecturer	JOSE MARIA SENTIES VIAN
E-mail	jose.senties@unican.es
Office	Facultad de Ciencias. Planta: + 3. DESPACHO PROFESORES (3028)
Other lecturers	JOSE ANGEL MIER MAZA

### 3.1 LEARNING OUTCOMES

- Know the operation and use of basic equipment in electricity and magnetism laboratory (galvanometer, ammeter, voltmeter, ohmmeter, oscilloscope, electrometer, current and voltage sources, power meter, function generator, digital and analog multimeters, teslameter)
- Know the meaning and experimental testing of fundamental laws such as: Coulomb's law, Faraday's law, Ampere's law and law BiotSavart
- Understand the phenomenon of electrostatic induction
- Know the radiation phenomena, diffraction and interference of electromagnetic waves
- Solve potential problems in two dimensions.
- Solve simple AC circuits both transient and steady
- Design properly tables and graphs
- Make correctly errors analysis
- To consolidate the ability to elaborate scientific reports.

### 4. OBJECTIVES

- Being able to analyze the relevant physical parameters to study an electromagnetic phenomenon.
- Analyze and discuss the experimental results comparing them with the assumed model
- Knowing how to prepare a report describing an experiment and properly presenting the results including error analysis
- Knowing how to behave in the laboratory both individually and in group.
- Handle tools and mathematics necessary for conducting experiments
- To be able to develop further actions or complementary experiments analyzing their viability

### 6. COURSE ORGANIZATION

#### CONTENTS

1	<p>Theoretical introduction</p> <ul style="list-style-type: none"> <li>- Electrostatic field and electrostatic potential.</li> <li>- Conductors in electrostatic equilibrium. Capacity.</li> <li>- Methods of solving electrostatic problems.</li> <li>- Magnetostatic field. Ampere's and Biot-Savart's laws</li> <li>- Behavior of a dipole in a uniform magnetic field</li> <li>- Faraday's law.</li> <li>- Hysteresis loop in ferromagnetic materials</li> <li>- Resolution of linear circuits.</li> <li>- Stationary and transient response in AC circuits.</li> <li>- Power in AC circuits</li> <li>- Propagation of electromagnetic waves</li> <li>- Reflection, interference and diffraction phenomena</li> <li>- Antenna radiation pattern</li> </ul> <p>Practical Introduction</p> <ul style="list-style-type: none"> <li>- Error analysis</li> <li>- Preparation of reports</li> </ul>
2	<ul style="list-style-type: none"> <li>- Instrumentation an circuits experiments</li> <li>- Electrostatic experiments</li> <li>- Magnetostatic experiments</li> <li>- Electromagnetic induction experiments</li> <li>- Electromagnetic waves experiments</li> </ul>

### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
	Work	No	No	50,00
	Written exam	Yes	Yes	30,00
	Laboratory evaluation	No	No	20,00
TOTAL				100,00
Observations				
Observations for part-time students				
As far as possible, and in accordance with the teacher, it will try to facilitate monitoring of the subject.				

### 8. BIBLIOGRAPHY AND TEACHING MATERIALS

#### BASIC

El documento básico de trabajo es el guión de la misma, elaborado por los profesores de la asignatura y se le entrega al alumno una semana antes de la realización de la práctica

Campos Electromagnéticos. R.K. Wangsness