

SUBJECT TEACHING GUIDE

G38 - Multidisciplinary Laboratory

Double Degree in Physics and Mathematics
Degree in Physics

Academic year 2018-2019

1. IDENTIFYING DATA					
Degree	Double Degree in Physics and Mathematics Degree in Physics			Type and Year	Core. Year 1 Core. Year 1
Faculty	Faculty of Sciences				
Discipline	Subject Area: Multidisciplinary Laboratory Basic Module				
Course unit title and code	G38 - Multidisciplinary Laboratory				
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. CIENCIAS DE LA TIERRA Y FISICA DE LA MATERIA CONDENSADA				
Name of lecturer	JUAN REMONDO TEJERINA				
E-mail	juan.remondo@unican.es				
Office	Facultad de Ciencias. Planta: + 2. DESPACHO PROFESORES (2018)				
Other lecturers	M. CARMEN PESQUERA GONZALEZ XABIER EDUARDO MORENO-VENTAS BRAVO IGNACIO HERNANDEZ CAMPO LORENA GONZALEZ LEGARRETA				

3.1 LEARNING OUTCOMES

- To recognize and to identify given geological processes and their relation to physical models , doing simple analytical determinations of sediments and characterizing their mineral components.
- To know the different organization levels of living beings in nature and the main physical parameters governing the organisms distribution.
- To know how to analyze a given biological community through the macro- and microscopic observation and identification of the organisms present in a given sample of the community.
- To understand the mathematical laws governing the growth of a microbial population and to know how to model its development.
- To know the most important chemicals in a natural system and to determine the physical and chemical conditions for their corresponding suitable presence. To understand the principle of chemical equilibrium. To know the different chemical reactions (acid-base, salt precipitation and oxidation-reduction) which occur in a natural system.
- To produce a correspondingly structured report showing data, analysis and interpretation as well as their interrelations.
- To know common characterization techniques for natural and synthetic materials , including their physical basis and applications.

4. OBJECTIVES

- To make the students understand the unity of nature and the interrelations between different natural processes and phenomena.
- To establish the connecting points between different disciplines in the area of Natural Sciences and the need to study natural phenomena from a multidisciplinary point of view.
- To understand the interest of natural phenomena interconnections through their analysis.
- To present the integral analysis of a natural system, approached from complementary interdisciplinary points of view.
- To understand the planning of simple scientific experiments in order to analyze phenomena , based on different Natural Science disciplines (Physics, Chemistry, Biology and Geology).
- Student acquisition of necessary intellectual and manual skills for the scientific work.

6. COURSE ORGANIZATION

CONTENTS

1	EARTH DYNAMICS AND MATERIALS: Planet Earth, origin and structure. Internal and external dynamics. Earth materials: rocks and minerals. Material characterization: petrological and sedimentological techniques. Microscopic, Spectroscopic and X-ray diffraction techniques.
2	CHEMISTRY OF NATURAL SYSTEMS: Chemistry of a natural system, chemical reaction, kinds, stoichiometry, ionic equilibrium in solution, acid-base, precipitation and oxidation-reduction reactions. Determination of chemical features of a natural system, sample collection, chemical identification, pH, salinity, conductivity, etc.
3	ECOLOGY OF NATURAL SYSTEMS: The living beings and the natural system. Organisms, populations and communities. Ecological models; types. Relations between living beings, the physical, chemical and geological parameters.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Laboratory practical work. Lab. report evaluation	Laboratory evaluation	No	Yes	50,00
Technical/practical exam	Written exam	Yes	Yes	50,00
TOTAL				100,00
Observations				
Observations for part-time students				
The assistance to laboratory-based practical work sessions and corresponding realization and submission of reports is mandatory for part-time students.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC
- R. Chang (2010). Química. 10ª Ed. Mc Graw Hill.
- R. Dajoz (2002). Tratado de Ecología. Ed. Mundi-prensa, 2ª ed.
- J.S. Monroe, R. Wicander, M. Pozo (2008). Geología: Dinámica y Evolución de la Tierra. Ed. Paraninfo-CENAGE Learning, 4ª ed.
- Marisol Faraldos, Consuelo Goberna (editoras) (2003), Técnicas de análisis y caracterización de materiales. Ed. Consejo Superior de Investigaciones Científicas.