

SUBJECT TEACHING GUIDE

G38 - Multidisciplinary Laboratory

Double Degree in Physics and Mathematics
Degree in Physics

Academic year 2020-2021

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				
In the laboratories, the use of lab coats and safety glasses that students must acquire will be compulsory. Without this material, entry into the laboratory will not be allowed (UC laboratory work regulations).				
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. Disponible en versión pdf.
- 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.