

Faculty of Sciences

SUBJECT TEACHING GUIDE

G1995 - Chemistry and its application in Natural Systems

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 Degree in Physics			Type and Year	Core. Year 1 Core. Year 1				
Faculty	Faculty of Sciences								
Discipline	Chemical Matter and Its application in Natural Systems Basic Module								
Course unit title and code	G1995 - Chemistry and its application in Natural Systems								
Number of ECTS credits allocated	6	Term		Semester based (2)					
Web									
Language of instruction	Spanish	English Friendly	Yes	Mode of o	delivery	Face-to-face			

Department	DPTO. CIENCIAS DE LA TIERRA Y FISICA DE LA MATERIA CONDENSADA		
Name of lecturer	JUAN REMONDO TEJERINA		
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Office	Facultad de Ciencias. Planta: + 2. DESPACHO PROFESORES (2018)		
Other lecturers	XABIER EDUARDO MORENO-VENTAS BRAVO		
	CESAR MORENO SIERRA		
	LORENA GONZALEZ LEGARRETA		
	MIGUEL GARCIA IGLESIAS		

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3.1 LEARNING OUTCOMES

- - To understand how to focus simple experiments involving basic phenomena in different disciplines of the natural sciences . To become familiar with the interconnections between these natural phenomena.
- To understand the need for an integrated analysis, approached from complementary perspectives, to study a natural system, identifying the essential parameters. In particular:
- * the chemical point of view: most relevant organic and inorganic chemical components and their properties, possible reactions and monitoring.
- * the geological point of view: composition of the geological environment and dynamic of geological processes.
- * the biological point of view: biological communities and impact of the processes in their distribution and evolution.
- To become familiar with basic instrumentation to collect essential data on natural systems and to understand the physico-chemical basis of that instrumentation.
- To understand the basis of simple mathematical models applied to analyze natural systems. To know how to make graphs of evolution and to validate them experimentally.

4. OBJECTIVES

- To make the student understand the unity of Nature and the interrelationships between the different processes and natural phenomena. To stablish the connecting points between the different disciplines within Earth Sciences and the need to study natural phenomena from a multidisciplinary perspective.

- To know the most relevant organic and inorganic chemical components and their properties, as well as the possible chemical reactions.

- To become familiar with chemistry and to understand its importance and the applications for the study of natural systems .
- To understand examples of chemistry applied to the study of natural systems.
- To understand the planning of simple scientific experiments in order to analyze phenomena, based on different Natural Science disciplines (Physics, Chemistry, Biology and Geology).

6. COURSE ORGANIZATION					
CONTENTS					
1	Unit 1 Introduction to the chemistry of natural systems. Unit 2 Basic concepts of chemistry, chemical solutions. Structure of matter. Chemical bond. Exercises and problem solving. Laboratory practical work.				
2	Unit 3 Chemical equilibrium. Acid-base reactions. Precipitation reactions. Exercises and problem solving. Laboratory practical work.				
3	Unit 4 Geochemistry, analysis of Earth's materials; practical cases of chemistry applied to geology.				
4	Unit 5 Case studies of chemistry applied to biology.				



7. ASSESSMENT METHODS AND CRITERIA								
Description	Туре	Final Eval.	Reassessn	%				
Laboratory practical work. 3 reports on the laboratory work will be delivered electronically throughout the semester.	Laboratory evaluation	No	Yes	40,00				
Technical/practical written exam.	Written exam	Yes	Yes	60,00				
TOTAL				100,00				
Observations								

In the laboratories, the use of lab coats and safety glasses that the 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

For part-time students it is also mandatory to attend laboratory practices, as well as delivery of the corresponding reports.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

- R. Chang (2010). Química. 10ª ed. Mc Graw Hill.

- Th. L. Brown, H.E. LeMay (Jr), B.E. Bursten, J.R. Burdge (2004). 9^a ed. Química. La ciencia central. Ed. Pearson-Prentice Hall.

- Bibliografía suministrada por el profesorado de la asignatura.