

SUBJECT TEACHING GUIDE

G76 - Physics of the Earth

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	Optional. Year 5 Optional. Year 4
Faculty	Faculty of Sciences				
Discipline	Subject Area: Physics of the Earth Mention in Applied Physics				
Course unit title and code	G76 - Physics of the Earth				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. CIENCIAS DE LA TIERRA Y FISICA DE LA MATERIA CONDENSADA				
Name of lecturer	ALBERTO GONZALEZ DIEZ				
E-mail	alberto.gonzalez@unican.es				
Office	Facultad de Ciencias. Planta: + 2. DESPACHO PROFESORES (2006)				
Other lecturers	JOSE RAMON SOLANA QUIROS				

3.1 LEARNING OUTCOMES

- Understanding the physical basis of atmospheric phenomena. The student should be able to apply the laws of thermodynamics, optics, dynamics, etc. to determine the properties of the atmosphere.
- Understanding the constitution of the Earth and its dynamics. Knowledge of physical principles which drive the terrestrial dynamic

4. OBJECTIVES

Knowing the structure and composition of the Earth, as well as physical principles used for determining them applying prospecting techniques

Knowing the importance of plate tectonics in the dynamics of the planet

Knowing the physical foundations of the geological processes that govern the planet

Understanding the physical basis of atmospheric phenomena

Apply the laws of thermodynamics, optics, dynamics, etc. to determine the properties of the atmosphere

6. COURSE ORGANIZATION

CONTENTS

1	1. What is the Earth Physics; 1.2. The Earth system and its structure.
2	2. Physical fundamentals of atmospheric phenomena. 2.1. Origin and composition of the atmosphere. 2.2. Radiation in the atmosphere. 2.3. Thermodynamics of the atmosphere. 2.4. Fundamentals of atmospheric dynamics.
3	3. Physical Properties of the atmosphere 3.1. The atmospheric layers. 3.2. Radiative equilibrium in the atmosphere. 3.3. Physics and cloud microphysics. Precipitation. 3.4. Atmospheric dynamics. 3.5. Air masses, fronts and depressions.
4	4. The structure and Earth composition. Geophysical parameters; 4.1. The Internal structure of the planet, its layers and the geodynamic meaning. 4.2. Methods for studying the inside of the planet (Gravimetry, magnetometry, electrical methods, seismic methods, other methods). 4.3. Methods for studying the outside of the planet (Remote sensing, Global positioning system, thematic mapping).
5	5. Dynamic of tectonics plates and active processes; 5.1. Principles of rock mechanics 5.2. Stress-strain, stress-deformation, the role of the water in the deformation; 5.3. Plate Tectonics and internal processes; 5.4. External processes and its determining factors 5.5. Dynamics of external processes: Mass movements, glacial-periglacial processes, fluvial processes and marine processes. Natural hazards. Construction of risk maps .

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
This exercise is dedicated to those students who do not pass the continuous assessment. It will be a theoretical- practical test of the contents dealt. The value of this test is the same to those given in the continuous evaluation exercises.	Written exam	Yes	Yes	0,00
Conducting theoretical practical tests on each of the blocks on the agenda of the subject. The recovery of this area will be in a final exercise. Written exercise, which gives the 50% of the final califitation	Written exam	Yes	Yes	50,00
Presentation and defense of a classwork about a topic described in the agenda. This activity is recoverable with the completion of a new job in which detected errors are resolved. The recovery of this area will be in a final exercise. This exercise, gives	Work	Yes	Yes	50,00
TOTAL				100,00
Observations				
During the course, four qualifying exercises shall be performed, which ones correspond to the types described above. These will be used to evaluate each block of the thematic defined in the course. For those students who do not pass the continuous assessment a final theoretico-practical review will be conducted, covering the different blocks that make up the subject. The exercise will have a limit duration of 3 hours.				
Observations for part-time students				
In the case of a student has a special regime, as far as possible and in accordance with the Professor, it will be tried facilitating the monitoring of the subject and the possibility of providing of special examinations. The extraordinary exercise will be looking a similar format to the final exam described in the previous section.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Stacey, F.D. & Davis, P.M. Physics of the Earth. 2008. Cambridge University Press, 546 pp.