SUBJECT TEACHING GUIDE

G76 - Physics of the Earth

Double Degree in Physics and Mathematics
Degree in Physics

Academic year 2022-2023

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
- To understand the physical basis of atmospheric phenomena
- Be able to apply the laws of thermodynamics, optics, dynamics, etc. to determining the properties of the atmosphere
- To know the Earth's components. Geophysical parameters
- To establish the role of the plate dynamics

4. OBJECTIVES
Knowing the structure and composition of the Earth, as well as physical princios 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. Global Change.
2	2. Physical fundaments of atmospheric phenomena. 21. 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. Principles of rock mechanics. Stress-strain, stress-deformation, the role of the water in the deformation; 4.2. The Internal structure of the planet, its layers and the geodynamic meaning. 4.3. Methods for studying the inside of the planet (Gravimetry, magnetometry, electrical methods, seismic methods, other methods). 4.5. 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. Inner Processes: Sismicity and Vulcanism 5.2. Plate Tectonics and its dynamics 5.3. Natural hazards. Construction of risk maps. 5.4. External processes and its determining factors 5.5. Dynamics of external processes: Mass movements, glacial-periglaciares processes, fluvial processes and marine processes. Others.

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 evalutation 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	Written exam	Yes	Yes	50,00
TOTAL				100,00

Observations

During the course there will be several grading exercises (which will correspond to the blocks described in the teaching organisation), which will be used to assess whether the student passes the contents presented in each block. In order to pass the course, the overall average must be 5 or higher. For those students who do not pass the continuous assessment, there will be a Final Examination of a theoretical-practical nature, which will cover questions corresponding to the different blocks that make up the subject. The exercise will have a time limit of 4 hours, and the considerations for passing it will be the same as in the continuous assessment.

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.