

26404 - Fundamentals of Geology and Geological Mapping

Syllabus Information

Academic year: 2023/24

Subject: 26404 - Fundamentals of Geology and Geological Mapping

Faculty / School: 100 - Facultad de Ciencias

Degree: 296 - Degree in Geology

588 - Degree in Geology

ECTS: 9.5

Year: 1

Semester: First semester

Subject type: Basic Education

Module:

1. General information

This subject offers a global and interdisciplinary vision of Geology. It aims to lay the conceptual and practical foundations of geology and cartography starting from a base of knowledge, terminology and skills, which allow to approach other more specific subjects of the degree.

The subject is focused on the student's understanding that our planet is a dynamic and complex system, and that geological processes, together with other natural processes, condition its functioning and evolution. It helps to understand how natural resources are generated, to map units of interest and to understand that rocks record information about past biological or climatic changes, among other aspects.

These approaches are aligned with the following Sustainable Development Goals (SDGs) of the 2030 Agenda of United Nations (<https://www.un.org/sustainabledevelopment/es/>), in such a way that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement: 4, 6, 7, 9, 11, 13, 14, 15

2. Learning results

The learning results of this subject are focused on providing the student with an initial training that will allow them to progress correctly in the rest of the geological subjects of the Degree. Specifically:

- Know and be able to explain the theoretical foundations and elementary concepts of geology and cartographic representation.
- Understand the dynamics of the planet and the external and internal geological processes.
- Know the geological history of the Earth and the most relevant geological units.
- Be able to identify and describe simple geological samples and to work with basic cartographic information, both extracting information from maps and incorporating geological data into a cartographic base.
- Be able to analyse and synthesize general and specific scientific information on Geology, elaborating the results and presenting them orally or in writing.
- Be able to identify and classify at a basic level geological materials in the field, as well as to extract basic geological information by observation and use of specific material, organizing and representing the collected data in elaborated personal notes.

3. Syllabus

Theory

1. Introduction to Geology. The Earth as a planet: context, structure, composition. Introduction to global dynamics. Plate tectonics. Formation of mountain ranges and basins.
2. Minerals and crystals. Characterization of crystalline matter. Classification of minerals.
3. Exogenous, Igneous and Metamorphic Rocks. Characteristics, classification and formation processes.
4. Topographic and geologic maps. Geological sections.
5. Horizontal and inclined geological successions. Folds and faults.
6. Weather in geology. Dating methods.

7. Introduction to historical and regional geology.
8. The fluid masses of the Earth: atmosphere and hydrosphere.
9. External geodynamics: geological processes and geomorphology.

Laboratory

- Characterization and identification of minerals, sedimentary, igneous and metamorphic rocks.
- Introduction to the study of fossils.
- The map and topographic profiles.
- Mapping of horizontal and inclined stratigraphic series.
- Direction, dip and thickness.
- Simple geological sections in series with discontinuities, folds and faults.

Field

- 3 field trips to identify materials, units, structural and cartographic features.

4. Academic activities

The teaching activities during the term are as follows:

Activity 1: Acquisition of basic knowledge of Geology and Cartography. **Methodology:** participatory and theoretical-practical lectures. (52 hours)

Activity 2: Description and identification of minerals, rocks and fossils. **Methodology:** laboratory practices (visu), in two-hour sessions. (6 hours)

Activity 3: Reading, interpretation and elaboration of maps and geological sections. **Methodology:** laboratory practices, in two-hour sessions. (22 hours)

Activity 4: Identification of geological aspects and field mapping work. **Methodology:** field practices : three field days.

5. Assessment system

Continuous evaluation:

- 2 Theoretical-practical tests corresponding to topics 1-3 and 6-9 respectively. (40%).
- Practical test corresponding to block 4-5 focused on the resolution of exercises of cartography. (40%)
- Practical test of description of minerals/rocks and fossils. (10%)
- Field practices: the results elaborated by the student in the days of field trips and the exercises carried out in practices based on them will be evaluated. (10%)

A grade of 5 out of 10 or higher is required to pass each test. The parts not passed must be evaluated in the global test.

Attendance at field practices is compulsory, unless there is a duly justified cause

Students who have not passed the continuous evaluation will have to take the overall exam for the parts not passed.

Global test:

Students who have not passed the subject or those who wish to improve their grade will have the right to a global evaluation test that will include:

- Test on the basic theoretical knowledge of Geology (40% of the grade) and test related to the contents of cartography (40% of the grade)
- Practical visu test (recognition of geological samples; 10% of the grade).
- Practical test of interpretation of field data (recognition of geological units, interpretation of their relationships and the geological structure (10% of the grade).