Universidad Zaragoza

Academic Year/course: 2023/24

26416 - Geological Mapping

Syllabus Information

Academic year: 2023/24
Subject: 26416 - Geological Mapping
Faculty / School: 100 - Facultad de Ciencias
Degree: 296 - Degree in Geology
588 - Degree in Geology
ECTS: 9.0
Year: 3
Semester: First semester
Subject type: Compulsory
Module:

1. General information

1.1. Objectives

To learn how to elaborate geological cartographies by applying specific methodologies: geological data collection and their interpretation, making geological slices from the maps and their interpretation, handling of specific tools such as geological compass, aerial photographs, orthoimages and GIS applications

1.2. Sense of the subject

Geological mapping represents the practical and conceptual synthesis of different areas of knowledge of the Earth Sciences : Petrology, Stratigraphy, Palaeontology, Sedimentology and Structural Geology.

1.3. Requirements

It is recommended to take this subject prior to any other subject whose contents require the use of geological maps.

SDG 13 Climate Action, and 4 Quality Education

2. Learning results

To pass this subject the student must demonstrate the following results:

- Using the geologic map: a) identify the main types of tectonic structures; b) make cross-sections and diagrams reflecting the geometry of the structures and the relationships between them; c) deduce all or part of the geologic history of the geologic history of a region

- From field observations: a) identify all types of contacts (stratigraphic, structural; b) identify the main types of tectonic structures and, using their geological characteristics (lithology, orientation, type of contacts, etc.), draw a geological map, c) perform cross sections and diagrams reflecting the geometry of the structures and how they are related to each other d) deduce all or part of the geological history of a region.

- Use photo geology as a cartographic technique.

- Know and apply the system of dimensioned plans to solve geological mapping problems.

- Using a geological compass, measure the orientation of stratigraphic contacts and geological structures of all kinds, and locate and represent these data on a topographic map.

- Thematic mapping (sedimentological, structural, paleoecological...).

- Perform 3D renderings from surface and subsurface data.

- Locate and read scientific articles in Spanish and English; select and understand the relevant information they contain.

- Work autonomously and in a team; carry out and write an original scientific work and be able to defend the results in public

Importance of learning results:

Geological Cartography, understood as the set of techniques used to make geological maps, is the fundamental tool on which any geological work is based. A correct geological mapping depends not only the correct interpretation of the geological history of the region represented, but also the proper use of the geological heritage , which includes both material resources (rocks, minerals and fossils) and cultural resources (Places of Geological Interest, Geological Observation Points or Areas of Geological Interest, all of them recognized figures within the National Geological Heritage).

3. Syllabus

3.1. Theory

- Principles and concepts of topography and geological mapping
- Projection system using dimensioned drawings
- Introduction to cartography with Google Earth and QGIS
- Map reading and interpretation

3.2. Office practice sessions

- Geological data acquisition with compass and its stenographic representation (1 session)
- Geological photointerpretation from aerial photographs and orthoimages (5 sessions)
- Dimensioned plane exercises (4 sessions)
- Exercises based on geological maps (8 sessions)
- Cartography with QGIS (2 session)

3.3. Field practices

4. Academic activities

- Acquisition of theoretical knowledge: lectures.
- Field data acquisition: 7 days dedicated to field mapping, survey of stratigraphic columns and measurement of orientations with geological compass.
- Carrying out of exercises using dimensioned drawings: office practices, problems and cases.
- Photogeological interpretation: laboratory practice with stereoscope.
- Learning digital cartography using QGIS: computer practices.
- Reading and interpretation of geologic maps: cabinet practices, problems and cases.
- Geological data collection and mapping in mining environments: field, office and laboratory practices.

5. Assessment system

5.1) CONTINUOUS EVALUATION

- Written tests 1 and 2: 20%
- Office practices: 30%
- Cartographic study of a region: 15%
- Field area: 35%

Content of the activities:

- Written test 1: theoretical and practical questions on dimensioned plans.
- Written test 2: reading and interpretation of maps.- Office practices 10 practices (excluding those associated with the cartographic study of a region and field area).
- Cartographic study of a region: report of 1 field session and 4 sessions of cabinet/laboratory practices.
- Field area: report of 5 field days and 4 practice sessions.

In order to pass the subject by means of continuous evaluation, each of the five separate evaluation activities must be passed with a grade higher than 5. However, for those who have not passed either of the two written tests , there will be a recovery test in which an average grade of 5 and a minimum grade of 4 must be obtained in each test.

5.2) GLOBAL EVALUATION

- Written tests: 20%
- Practical test: 20%
- Additional test: 60%

Content of activities

- Written tests 1 and 2: similar to modality 5.1.
- Practical test: exercises of the office practices.
- Additional test: includes field examination (geological mapping: 1 day) and test on the office practices (answer to questions on field work).

In order to pass the subject through continuous evaluation, each of the three separate evaluation activities must be passed with

a grade higher than 5.