

## 26408 - Structural Geology

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 26408 - Structural Geology

**Faculty / School:** 100 - Facultad de Ciencias

**Degree:** 296 - Degree in Geology  
588 - Degree in Geology

**ECTS:** 9.0

**Year:** 2

**Semester:** First semester

**Subject type:** Compulsory

**Module:**

### 1. General information

Structural Geology studies the recognition, representation and genetic and evolutionary interpretation of the structures of rocks produced by deformation processes in the earth's crust. Their learning requires more effort of comprehension and reasoning than memorization.

Objectives:

- To know the different types of tectonic structures.
- To develop observation and data collection skills.
- To handle tools for representation and analysis of structures.
- To apply concepts and models for regional tectonic interpretation and to fields of economic interest.
- To develop the capacity for autonomous and team learning, with a critical attitude.
- To communicate scientific knowledge and results orally and in writing.

Relationship to SDGs (<https://www.un.org/sustainabledevelopment/es/>): 4-Quality education (goals 4.3 and 4.4), 9-Infrastructure (Objective 9.5) and 12-Responsible production and consumption (target 12.2).

### 2. Learning results

1. To deepen the knowledge of the processes that generate tectonic structures.
2. To know how rocks deform when subjected to stresses.
3. To identify the main types of tectonic structures and know their geometric characteristics and their genetic mechanisms.
4. To draw maps, geological cross-sections and diagrams reflecting the geometry of structures and the relationships between them, from field observations.
5. To measure in the field the orientation of tectonic structures with compass.
6. To represent, treat and analyse structural elements, flat or linear, by means of stereographic projection, system of dimensioned plans and block diagrams.
7. To locate and read scientific articles in Spanish and English; select and understand the relevant information they contain in relation to specific problems.
8. -To work autonomously and in teams; to carry out and write an original scientific work; to expose and defend in public their results.
9. -To know and use the specific lexicon of Structural Geology, in Spanish and English.

### 3. Syllabus

THEORY: Introduction. Representation of tectonic structures. Orientation of planes/lines. Stereographic projection.

Stress, deformation and rheology. Basic concepts of stress. Fracturing mechanics. Joints Stylolite. Cracks of extension. Failures. Basic concepts of deformation. Textural scale ductile deformation. Tectonic fabrics Folds.

Folding mechanisms. Shear zones. Compressional, extensional, rifting, inversion, saline, gravity tectonics in intrusive bodies. Impact structures. Non-tectonic structures. Overlapping.

SEMINARS: Geological diagrams. Data collection. Efforts. Mohr's circle. Stereographic projection.

PRACTICES: Maps and geological sections (4). Riedel experiment. Stereographic (4) and orthographic projection. Tectonic fabrics

FIELD PRACTICES: 5 days.

#### 4. Academic activities

Master classes (30 classroom hours).

Seminars and case studies (5 classroom hours).

Laboratory practices (30 classroom hours; 10 sessions of 3 hours).

Field practices (5 field days).

Tutoring. Resolution of doubts and questions about the evaluation of the subject.

#### 5. Assessment system

##### (a) CONTINUOUS EVALUATION

a.1) Resolution of problems and/or practical exercises.

a.2) Participation in the field and/or presentation of notes.

a.3) Practical work.

a.4) Development of an academic paper, with oral presentation.

a.5) Two partial written tests, each with two parts: theoretical-practical questions and a practical exercise.

Unpassed parts of a.5 and activities a.1-a.4 remain pending for the final test.

General criteria:

Hand in practice reports; attend field trips and hand in the field notebook; hand in, present and defend the academic work; pass each part of each midterm written exam (only one part is compensated with a grade  $\geq 4.5$ )

Grade = (a.1 x 0.2) + (a.2 x 0.05) + (a.3 x 0.03) + (a.4 x 0.12) + (a.5 x 0.6)

##### (b) GLOBAL EVALUATION TEST

Students who request it one week in advance are entitled to a global evaluation; it includes a written test (b.1) and an additional practical test (b.2)

Grade = (b.1 x 0.5) + (b.2 x 0.5)

(c) Once the subject has been passed, the numerical grade may be corrected upwards, with the same percentage increase for all students and in the same call.