

## 27205 - Geology

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 27205 - Geology

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

**Degree:** 452 - Degree in Chemistry

**ECTS:** 6.0

**Year:** 1

**Semester:** Second semester

**Subject type:** Basic Education

**Module:**

### 1. General information

The main objective of this subject is to provide basic knowledge and skills in Geology, with an overview of geological processes and the dynamics of the planet, focusing on the fields directly related to Chemistry: Crystallography, Mineralogy and Petrology. It is oriented to learn about geological materials (minerals, rocks, soils and fossil fuels), their main characteristics and most relevant industrial applications. Special emphasis is placed on the structure, properties and study of crystalline matter, due to its direct link with Chemistry.

Taking this subject will enable students to contribute to the achievement of SDGs 4 (Quality education), 9 (Industry, innovation and infrastructure) and 12 (Responsible production and consumption) (Industry, innovation and infrastructure) and 12 (Responsible production and consumption).

No previous knowledge of Geology is required to take this subject, only basic knowledge of Mathematics, Physics and Chemistry.

### 2. Learning results

Upon completion of the subject, the student will be able to:

- Handle basic geological terminology, express correctly geological concepts and principles.
- Handle and differentiate concepts such as crystal, mineral and rock.
- Understand the basic concepts of crystallography and to identify and represent the external symmetry of crystals and minerals.
- Understand the structural and compositional diversity of minerals and rocks.
- Identify and describe minerals and rocks in hand specimen.
- Understand the Earth's structure and geological processes.
- Understand the various phenomena of mineral and rock formation in the geological cycle.
- Understand the genesis of a soil, its textural, structural and chemical characters and its classification.
- Know the natural resources (minerals and rocks) of major industrial interest, including coal and petroleum.

Many of the fields of professional development in chemistry are closely related to the contents covered in this subject, from those purely related to the study of the arrangement of elements in crystalline structures and the properties derived from them to the more applied fields of industrial chemistry, environmental chemistry, agricultural chemistry, etc. In all of them, a basic knowledge of the properties and characteristics of natural resources and the dynamics of the different units that make up our planet is essential.

### 3. Syllabus

**Theory (3.8 ECTS). The theory is divided into three blocks:**

- TB1: T1 Introduction. T2 The crystalline state. T3 Symmetry. T4 Minerals, structure and composition.
- TB2: T5 Earth and time in Geology. T6 Igneous environment. T7. Sedimentary environment. T8 Metamorphic environment. T9 Coal and oil. T10 Floors.
- TB3: T11 Minerals as raw materials. T12 Silicates. T13 Native elements, sulphides, oxides and hydroxides. T14 Sulphates, halides and carbonates. T15 Nitrates, phosphates and borates.

**Geometric Crystallography Practices, PrG. (0.7 ECTS):** will be devoted to practice with crystallographic models to learn to identify symmetry elements, determine point groups and perform stereographic projections.

**Mineral and rock recognition practices on hand specimen, PrV. (1 ECTS):** students will learn to identify and describe *visually* the most common minerals and rocks.

**Field practice, PrC, optional (0,5 ECTS)** a field trip will be carried out to recognize *in situ* outcrops with varied lithologies as an example of the different geological environments studied.

## 4. Academic activities

Theory will be taught through classroom lectures. The practices will be carried out with manipulative materials: crystallographic models and hand samples of minerals and rocks, with which students will work autonomously after brief introductory explanations.

Practical classes will begin about three weeks after the start of theory classes.

The date of the field trip (optional) will be specified at the beginning of the subject. During the activity the attendees will fill out a report that will be evaluated.

## 5. Assessment system

### **Continuous assessment**

Theory evaluation (60% of the final grade). There will be a test at the end of each theory block: TB1, TB2 and TB3. A minimum grade of 6.5 out of 10 will be considered a passing grade. Students who have passed two blocks and have obtained a grade equal to or higher than 5 in the remaining block will have passed the theoretical part of the subject. The theory grade will be the average of the grades obtained in the three blocks.

Practices evaluation (40% of the final grade). There will be a test at the end of each of the two practical parts: PrG and PrV. A minimum grade of 6 out of 10 will be considered a passing grade. If both tests are passed, the final grade for the practices will be:  $0.5 \cdot \text{PrG} + 0.5 \cdot \text{PrV}$ .

Field practice. Evaluation of the practices report (up to 1 point). Places will be limited and will be assigned according to the average grade obtained in the theory tests TB1 and TB2. The field grade will be added to the practices grade only if PrG and PrV are passed.

### **Overall assessment**

Examination of those parts not passed in continuous evaluation.

Theory (60% of the final grade): it will be considered passed with a minimum grade of 5 out of 10 in the whole of the subject

Practices (40% of the final grade): each part examined (PrG and/or PrV) will be considered passed with a grade equal to or higher than 5. If both tests are passed, the final practices grade will be:  $0.5 \cdot \text{PrG} + 0.5 \cdot \text{PrV}$ .

### **Remarks:**

The parts of the subject (TB1, TB2, TB3, PrG, PrV) passed, in continuous evaluation or in global evaluation, will be saved for the two official calls of the academic year.

In order to pass the subject it is necessary to have passed Theory, PrG and PrV with a minimum grade of 5 out of 10 in each of these three parts.

The field increment will also be applied in the global evaluation.