

28904 - Geology, soil science and climatology

Syllabus Information

Academic year: 2024/25

Subject: 28904 - Geology, soil science and climatology

Faculty / School: 201 - Escuela Politécnica Superior

Degree: 583 - Degree in Rural and Agri-Food Engineering

ECTS: 6.0

Year: 1

Semester: First semester

Subject type: Basic Education

Module:

1. General information

The student will learn the differences, composition, structure and genesis of rocks, sediments and soils and the spatial and temporal relationship among them. The concept of time in human life scale and geological processes is an important matter. In addition, the subject focuses on the importance of surface water, groundwater and soils in the natural environment and society.

The geological, edaphic and climatic systems are closely related and are the basis of all environmental dynamics. The knowledge provided is essential for soil management through agricultural practices and livestock

2. Learning results

To know the basics of geology essential to understand the current conditions of a given environment, and the need to foresee the consequences of an intervention or an activity developed on it.

To be able to identify the forming factors and relate them to soil properties. And understand the importance of the main physical, chemical and biological properties of soil.

To be able to understand soil-environment relationships, to situate a soil within a given environment and to relate it to its geological context.

To understand the importance of soil as an essential resource in agricultural production, its delicate balance, risks and possibilities of soil fertility management.

Ability to incorporate and coordinate the different sources of information that can be useful in the study of soil, geological substratum and climate (field studies, laboratory, cartography, aerial photography, datasets, satellite information, etc.)

Knowledge of the main sampling and laboratory sample analysis techniques, their application to soil and the value of the information they provide.

To be able to describe a soil pedion, differentiate the genetic horizons and recognize its main physical, chemical or biological properties, both in the field and with laboratory support (texture, structure, drainage, oxidation state, oxidation, iological activity, root disposition, etc.)

To know the basics of climatology, and the components of climate. Understanding that climate is a primary component of the physical environment that affects most activities in the rural environment.

To understand the basic aspects of atmospheric behavior on which meteorology is based. So that you can collect and take advantage of the information on the atmospheric situation and short-term forecasts.

In relation to FAO's Sustainable Development Goals (SDGs):

understand the importance of the soil as an essential resource in agricultural production, its delicate balance, the risks of desertification associated with erosion, contamination and possible treatment, salinization and possible improvements, and fertility management possibilities.

- understand the role of soil and soil management in climate change mitigation and pollution problems.
- to know the recycling capacity of by-products in the soil.
- in short, to understand the imperative need to preserve the soil resource in its full capacity of use, both for food and for the maintenance of the environment.

3. Syllabus

THEORY: Divided into three thematic blocks:

- **Geology:** Geological time, minerals and rocks, principles of stratigraphy, hydrogeology.
- **Soil Science or Edaphology:** Soil formation, components (mineral and organic), properties (physical, chemical and biological) of the soil and their relationship with agricultural management; Spatial variability of soil types (soil-

landscape relationships).

- **Climatology:** Basic principles and climatic elements.

LABORATORY PRACTICES: visu recognition of rocks; determination of soil properties: granulometry, organic matter, pH, etc

GABINET PRACTICES (Interpretation of maps and geological cross-sections)

FIELD TRIPS: geological description of salt-affected soils and contaminated aquifers. Description and tentative classification of a soil profile.

VIRTUAL COURSE ON INFORMATION: development of the structure and citation in academic papers.

4. Academic activities

The activities are divided into face-to-face (40% of the total of the subject) and non-face-to-face (60%).

FACE-TO-FACE ACTIVITIES.

- Theoretical sessions - Participative lectures.
- Laboratory practices in groups of 2-3 people for the identification of rocks and soil properties.
- Cabinet practice in the classroom for the resolution of practical problems.
- Field trips to analyze the geological and edaphic processes explained during the theoretical sessions. The fulfillment of these activities depends on the available budget.
- Virtual Information Course - Two 50-minute sessions to explain the contents of the subject and an appointment workshop.

NON-FACE-TO-FACE ACTIVITIES

- Study of the material taught in class (1-1.5 h of study per theoretical session)
- Elaboration of the practice booklet.
- Online realization of the VIRTUAL COURSE OF INFORMATION.
- Geology-edaphology work linked to the Virtual Course.

Theoretical and practical sessions will be related to SDGs 12, 13 and 15.

5. Assessment system

The final grade of the subject will be obtained from the sum of the partial grades of each of the assessment activities by applying the formula:

60% theory + 20% internship script + 20% work

The Theory will consist of two exams (one on Geology and the other on Soil Science), both of which must be passed in order to pass the subject. Practices and work are mandatory and must be passed in order to pass the subject. Plagiarism will be sanctioned with the failure of the work. The subject will be passed if the result of this sum, with the aforementioned conditions, is equal or higher than 5 points out of 10.

Those who take the Virtual Information Course will be rewarded 0.5% of the final grade of the geology part.

All the students who do not pass the course in the first call, will be able to take those parts not passed, keeping the grade obtained in the remaining parts.

Any of the parts with a grade of 5 or higher may be reserved for the next session. The student may choose between keeping the grade obtained or resubmitting the corresponding part in the following calls, in which case the grade that will prevail will be the one obtained in the most recent call.

The average success rate of the subject in the last three years is: 2020/21: 72,73%; 2021/22: 50%; 2022/23: 64,62%;

6. Sustainable Development Goals

12 - Responsible Production and Consumption

13 - Climate Action

15 - Life on Land