# COURSE DATA

## DATA SUBJECT

**Code:** 33084
**Name:** Edaphology
**Cycle:** Undergraduate Studies
**ECTS Credits:** 4.5
**Academic year:** 2025-26

## STUDY (S)

| Degree | Center | Acad. year | Period |
|---|---|---|---|
| 1104 - Degree in Environmental Sciences | Facultat de Ciències Biològiques | 2 | First quarter |

## SUBJECT-MATTER

| Degree | Subject-matter | Character |
|---|---|---|
| 1104 - Degree in Environmental Sciences | Edaphology | COMPULSORY |

## COORDINATION

CARBO VALVERDE ESTER

ROCA PEREZ LUIS

# SUMMARY

As part of the environment, soil survey is fundamental to the knowledge of it. In this discipline is to impart knowledge on soil formation and evolution, classification and distribution in the landscape. Students will learn the factors that influence the formation of soil, both general and specific processes are developed and the final type of soil that is formed to then classify and learn the techniques for analyzing their spatial distribution.

Such knowledge could be translated to the recognition of genetic processes and soil types in laboratory and field. The student will apply the theoretical to actual cases of soil and interpret the physical, chemical and physicochemical soil. Be taught to handle these data to recognize the kinds of soil and study will be completed in developing mapping techniques for translating the results into maps of soils (basic properties and thematic).

# PREVIOUS KNOWLEDGE

## RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

### OTHER REQUIREMENTS

It is essential to have basic knowledge of the matters proposed by the first year in particular those that are integrated in the subjects Mathematics, Physics, Chemistry, Biology and Geology.

## COMPETENCES / LEARNING OUTCOMES

### -

Comprender y manejar diferentes escalas espaciales y temporales en la interpretación de los sistemas naturales.

Relacionar las propiedades y tipos de suelos con la litología, geomorfología, clima, vegetación y edad de la formación superficial.

## DESCRIPTION OF CONTENTS

### 1. FORMATION AND EVOLUTION OF THE LAND: FACTORS AND PROCESSES

Item 1. Soil Science. Historical evolution. Concept. Soil functions.
Item 2. Organization of the soil. Soil profile. Horizon nomenclature. Master Horizons and Diagnostic Horizons. Spatial variability.
Item 3. Soil forming factors. Climate and soil distribution. Parent material and soil properties. Toposequences. Topography and soil properties. Landscape units and soil catena. Time as a factor . Bodies such as forming factor. Evolution of the soil.
Item 4. Formation processes. Weathering. Physical weathering, chemical and organobiológica. Soil processes. Additions and changes of substances in the soil. Translocations and losses of substances in the soil. Large Processes.

### 2. SOIL COMPONENTS. PHYSICAL, CHEMICAL AND BIOLOGICAL SOIL PROPERTIES

Item 5. Inorganic soil constituents. Origin and composition of the inorganic solid phase. Mineral soil constituents. Silicates. Soil clay minerals. Types of clays. Origin of clays. Significance of soil clay minerals .. Non-crystalline silicate minerals and silicate minerals. Pedological importance and significance of non-silicate minerals.
Item 6. Organic soil constituents. Origin and composition of soil organic matter. Dynamics of organic matter, mineralization and humification. Fractionation of organic matter. Characteristics and properties of humic substances. Importance of soil organic matter.
Item 7. Liquid and gas phase. Water and soil solution. Matrix and osmotic potential. Types of water on the floor. Affected properties. The soil atmosphere. Composition and factors. Influence of aeration on biological activity and its natural evolution.

Item 8. Temperature and soil color. Thermic properties of soil. Temperature regimes. Soil color. Main elements chromogens. Custom coding and interpretation.
Item 9. Texture and soil structure. Size fractions and textural classes. Textural classifications. Importance and significance of the texture. Structure. Morphology. Stability. Interaction fraction organic - mineral fraction. Organo-mineral complexes. Clay-humic complex. Organo-metallic complexes. Related properties.
Item 10. Ion exchange and pH. Cation and anion exchange. Exchange complex. Soil reaction. Concept of acidity and alkalinity. Buffering capacity. Redox potential. Redox reaction and its significance in the ground

**3. AND INVENTORY: USE AND APPLICATIONS. FUNCTIONS OF SOIL AND ENVIRONMENTAL QUALITY**

Item 11. Soil Classification and nomenclature. Evolution of the classifications. Current classification systems. Soil Taxonomy and World Reference Base for Soil Resources: criteria for classification / nomenclature and hierarchical levels.
Item 12. Soil mapping. Types of maps. Map units and taxonomic units. Scale, legend and map quality. Geographic information systems applied to soil mapping.

**4. LABORATORY PRACTICE**

PRACTICE 1. Introduction to the study of soil samples. Description of profiles and horizons. Preliminary characteristics.
PRACTICE 2. Physical properties: texture, structure, permeability and bulk density.
PRACTICE 3. Chemical properties: pH, carbonates, study of the soluble salts (Preview test and saturation extract).
PRACTICE 4. Study of the soil organic matter

## WORKLOAD

### PRESENCIAL ACTIVITIES

| Activity | Hours |
|---|---|
| Tutorials | 2,00 |
| Theory | 27,00 |
| Laboratory | 16,00 |
| **Total hours** | **45,00** |

### NON PRESENCIAL ACTIVITIES

| Activity | Hours |
|---|---|
| Attendance at other activities | 0,00 |

| | |
|---|---|
| Individual or group project | 12,50 |
| Independent study and work | 10,00 |
| Preparation of lessons | 25,00 |
| Preparation for assessment activities | 20,00 |
| Resolution of case studies | 0,00 |
| **Total hours** | **67,50** |

## TEACHING METHODOLOGY

**Theoretical lectures**

These sessions are face-to-face and will provide an overview of the subject and will focus on those concepts that are important for the understanding of the subject.

**Practical laboratory classes**

The laboratory sessions are presential and will be developed in groups of sixteen students with the presence of a teacher at all times. Prior to the sessions the students will have a practical guide where the experiments to be carried out in each session will be explained. The teacher in charge will comment on the characteristics of the experience at the beginning of the session. After the development of the laboratory work, supervised by the teacher, the students will have to make a detailed report of the results of the experience.

**Tutorials**

The tutorials will be mainly working sessions, on questions and problems of the subject, tutored by the teacher. In these exercises will be carried out and will be delivered to the teacher on the proposed date.

The student is provided with the teaching material presented in the lectures, as well as bibliography in the virtual classroom of the subject.

## EVALUATION

During the development of the subject, both theoretical and practical classes, there will be a:
Continuous 1.Valoración each student, based on regular attendance at classes and classroom activities, participation and degree of involvement in the process of teaching and learning and skills and attitudes displayed during the development of activities.
2. Evaluation practical activities from the preparation of reports (mandatory) and exhibits the results obtained with the interpretation thereof.

Both continuous assessment and evaluation of practical activities correspond to a maximum of 20% of the final grade. Attendance at practices is mandatory. Failure to pass the course, this assessment will be considered for the next course.

Evaluation of an objective test consisting of a written exam consisting of theoretical and practical issues. Corresponds to a maximum of 80% of the final. To pass the course you must obtain a grade of at least **5** out of 10 **in each of the activities** (theory and practical) to do the weighted average of the final grade taking overcome with 5 to count the other parties and pass the course

## REFERENCES


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