COURSE DATA

Data Subject	
Code	33084
Name	Edaphology
Cycle	Grade
ECTS Credits	4.5
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
1104 - Degree in Environmental Sciences	Faculty of Biological Sciences	2	First term

Subject-matter

Degree	Subject-matter	Character
1104 - Degree in Environmental Sciences	122 - Edaphology	Obligatory

Coordination

Name	Department
BOLUDA HERNANDEZ, RAFAEL	25 - Plant Biology
CARBO VALVERDE, ESTER	25 - Plant Biology
ROCA PEREZ, LUIS	25 - Plant Biology

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 (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

1104 - Degree in Environmental Sciences

- Relacionar las propiedades y tipos de suelos con la litología, geomorfología, clima, vegetación y edad de la formación superficial.
- Comprender y manejar diferentes escalas espaciales y temporales en la interpretación de los sistemas naturales.

LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

The study of soil contributes to the development of skills and abilities of the degree through the acquisition during the study of the subject, the following capabilities:
Ability to analyze and synthesize

Ability to learn and ability to apply theory to practice

Ability to criticism and self

Ability to generate new ideas (creativity)

Ability to organize and plan

Ability to a commitment to sustainability

Ability to recognize problems so common in interdisciplinary environmental systems. Skills to work in multidisciplinary teams. The discussion of cooperation and group problem
Ability to make decisions, ability to develop and express independent judgments regarding processes related to the environment

Ability to analyze and synthesize data, interpretation and evaluation of scientific data displayed in tables, graphs and statistical expressions, criticism of the results
Being more specific:

Ability to analyze the main processes of genesis and evolution of soils, emphasizing the processes edafogenéticos and soil-forming factors.

Ability to deepen their knowledge related to soil: structure, function and interrelatedness of the three phases, organic and inorganic solid, liquid and gas exist in the same and the physical, chemical and physical-chemical you provide

Ability to recognize the main types of soils and their properties, and its relation to lithology, geomorphology, climate, vegetation and surface age of the formation.

Ability to interpret data obtained in the laboratory.

Capacity for analyzing their spatial distribution.

Ability to recognize the environmental functions of soil and the importance of quality.

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.
Item 13. Soil quality. Defining Quality and Multifunctionality. Productivist versus environmental perspective. Assessing soil quality: criteria and indicators. Methods and models of quality assessment. Current status and prospects

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

ACTIVITY	Hours	% To be attended
Theory classes	27,00	100
Laboratory practices	16,00	100
Tutorials	2,00	100
Development of group work	12,50	0
Readings supplementary material	10,00	0
Preparation of evaluation activities	20,00	0
Preparing lectures	15,00	0
Preparation of practical classes and problem	10,00	0
TOTAL	**112,50**	

TEACHING METHODOLOGY

For the teaching of the subject of Soil Science will be held classroom (theoretical and practical) and thematic seminars offered at the beginning of the course. This will be done in groups.
Other activities such as tutoring or monitoring of the course work will be carried out individually or in groups smaller than the previous activities. There will be a joint mentoring at the end of the theoretical agenda.
It provides the student with teaching material and selected bibliography in the Virtual Classroom materia.

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

Basic

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- CANARACHE, A.; VINTILA, I.; MUNTEANU, I. (2006). ELSEVIERS DICTIONARY OF SOIL SCIENCE. Definitions in English with French, German, and Spanish word translations. ELSEVIER. Amsterdam.

Additional

- - BONNEAU, M.; SOUCHIER, B. (1987). EDAFOLOGIA: Tomo 2. Constituyentes y Propiedades del suelo. Ed. Masson. Paris.
- DUCHAUFOUR, PH. (1987). Manual de EDAFOLOGIA. Ed.Masson. Paris.
- THOMPSON, L.M.; TROEH, F.R. (1980). Los Suelos y su Fertilidad. 4ª Edición. Ed. Reverté.Barcelona.
- WEIL, R.R. and BRADY, N.C. (2017). The Nature and Properties of soils. Ed. Perason.Essex, England.
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