Universitat de Lleida

DEGREE CURRICULUM

EARTH SCIENCE

Coordination: POCH CLARET, ROSA MARIA

Academic year 2023-24

EARTH SCIENCE 2023-24

Subject's general information

<table>
<tr><td>Subject name</td><td>EARTH SCIENCE</td></tr>
<tr><td>Code</td><td>102516</td></tr>
<tr><td>Semester</td><td>2nd Q(SEMESTER) CONTINUED EVALUATION</td></tr>
<tr><td>Typology</td><td>
<table>
<tr><th>Degree</th><th>Course</th><th>Character</th><th>Modality</th></tr>
<tr><td>Bachelor's Degree in Agricultural and Food Engineering</td><td>1</td><td>COMMON/CORE</td><td>Attendance-based</td></tr>
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<tr><td>Course number of credits (ECTS)</td><td>6</td></tr>
<tr><td>Type of activity, credits, and groups</td><td>
<table>
<tr><th>Activity type</th><td>PRACAMP</td><td>PRALAB</td><td></td><td>PRAULA</td><td>TEORIA</td></tr>
<tr><th>Number of credits</th><td>0.6</td><td>0.4</td><td>0.4</td><td>1</td><td>3.6</td></tr>
<tr><th>Number of groups</th><td>5</td><td>4</td><td>2</td><td>2</td><td>1</td></tr>
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<tr><td>Coordination</td><td>POCH CLARET, ROSA MARIA</td></tr>
<tr><td>Department</td><td>ENVIRONMENT AND SOIL SCIENCES AND CHEMISTRY</td></tr>
<tr><td>Teaching load distribution between lectures and independent student work</td><td>15 hours of individual work per credit received</td></tr>
<tr><td>Important information on data processing</td><td>Consult this link for more information.</td></tr>
<tr><td>Language</td><td>80% catalan
20% spanish</td></tr>
<tr><td>Distribution of credits</td><td>1.2 Climatology
0.8 Geology
4.0 Soil Science</td></tr>
</table>

EARTH SCIENCE 2023-24

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
ALVAREZ MORALES, DANIELA	daniela.alvarez@udl.cat	1,4	
BOSCH SERRA, ANGELA DOLORES	angela.bosch@udl.cat	1,6	
PEREZ GARCIA, PEDRO JESUS	pedro.perez@udl.cat	2	
POCH CLARET, ROSA MARIA	rosa.poch@udl.cat	6	

Subject's extra information

When talking about the objectives of an educational process, we must remember the four pillars of education highlighted in the UNESCO Report (Delors, 1996): learning to know, learning to do, learning to live with others and learning to be, as pathways for personal fulfillment and for activity in the world of work. Therefore, the objectives of this subject are framed in this context. Learning to know means understanding the world of soils, so you will need to introduce a set of concepts and terminology that will be very new to students. The study of the processes that characterize the system will allow us to understand what a soil is, how soils are formed, how they work, how they can be degraded. It will be taught how to study a soil in the field, how to take representative samples, how samples are treated and analyzed in the laboratory and how the results are interpreted. Maps and soil information will be used, case studies and problems will be studied in order to put into practice the knowledge that is being acquired. Another goal is to encourage autonomous and critical thinking. In this sense, students will be asked to read short, up-to-date texts that will help the student to forge his / her own criteria and determine for himself / herself how to act in various ways. circumstances: learning to be.

The aim of Climatology is to learn about the fundamental aspects of the climate system and its effects on agriculture and the natural environment, for which it is necessary to introduce a set of relatively new concepts and terminology for the student. The study of the different climatic variables and of the fundamental principles that explain the meteorological phenomena, will allow to explain the interactions between ground, water, air and heat. The result of the sum and interaction of all these climatic elements acting simultaneously, is what will allow to characterize the climate of a region, to carry out the description of the diverse types of climates and the climatic classifications.

Learning objectives

- Demonstrate theoretical knowledge about fundamental aspects of climate and its effects on agriculture and the natural environment, and in particular those that allow to explain the interactions between soil, water, air and heat.
- Know how to use methodologies and apply them to characterize the climate of a region, description of various types of climates and climate classifications.
- Demonstrate knowledge of geodynamic, internal and external geological processes. Anticipate the associated risks and the characteristics of the materials involved in these processes.
- Recognize and classify major forms and units of relief, according to their origin and functionality.

- Understand the geological aspects of groundwater circulation and soil formation.
- Learn to study the soils, the geological materials that have formed it, to interpret its behavior and to anticipate its possible responses to the various actions that can be taken, in order to manage and protect it with criteria. of sustainability.
- Demonstrate theoretical and applied knowledge about what a soil is, how soils are formed, how they work and how they can be degraded.
- Know how to use methodologies for the study of soils in the field, representative soil sampling and laboratory analysis.
- Know how to interpret the information represented in the soil maps.

Competences

General skills

CG1: That students have demonstrated that they possess and understand knowledge of the general secondary education base at a level that, while supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of this area.

CG2: That students know how to apply their knowledge to their work or vocation in a professional way and have the skills that are usually demonstrated by developing and defending arguments and solving problems within their area of study.

CG3: That students have the ability to gather and interpret relevant data to make judgments that include a reflection on relevant issues of a social, scientific or ethical nature.

CG4: That students can convey information, ideas, problems and solutions to both specialized and non-specialized audiences.

CG5: That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

CG6: Analyze specific situations, define problems, make decisions and implement action plans in the search for solutions.

CG7: Interpret studies, reports, data and analyze them numerically.

CG8: Select and release the available written and computerized sources of information related to the professional activity.

CG11: Understand and express themselves in the appropriate terminology.

CG12: Present information correctly orally and in writing (UdL strategic competence)

Specific skills

C1: Basic knowledge of geology and morphology of the terrain and its application in problems related to engineering. Climatology.

CEMC2. The bases of plant production, production, protection and exploitation systems.

CG2. Adequate knowledge of physical problems, technologies, machinery and water and energy supply systems, the limits imposed by budgetary factors and construction regulations, and the relationships between facilities or buildings and farms, agri-food industries and areas related to gardening and landscaping with their social and environmental environment, as well as the need to relate those and this environment to human needs and the preservation of the environment.

Subject contents

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Content of the subject

SYLLABUS OF THEORY OF SOIL AND GEOLOGY

1. Introduction: concepts and functions of the soil

2. The parent material: geology and geomorphology

3. Soil study: soil organization and morphology

4. The soil as a three-phase system. Texture

5. Inorganic components of soils: mineralogy

6. Organic components of soils

7. Soil organisms. Interactions

8. Genesis and classification of soils

9. Soil information: soil maps

10. Soil chemistry: ion exchange and soil reaction

11. Structure, aeration and soil water

12. Degradation, conservation and rehabilitation of the soil

SYLLABUS OF THEORY OF CLIMATOLOGY

1. Climatology: data and measurements.

2. Climate factors.

3. Overview of the atmosphere.

4. Solar energy: radiation.

5. Temperature, Pressure and Winds.

6. Air humidity: evaporation, condensation and precipitation.

Practical activities

SOIL ANALYSIS IN THE LABORATORY

1. Sample preparation

2. Field tests: calcium carbonate, textural class and color.

3. Soil reaction: pH in water and KCl. Interpretation

4. Equivalent calcium carbonate. Interpretation.

5. Organic matter. Interpretation.

6. Salinity test. Interpretation

METHODOLOGY FOR THE STUDY OF SOILS IN THE FIELD

Field trip: Criteria for locating soil pits in representative places. Description of soil profiles. Methodology for sampling. Soil conditions for land use. Classification of soils at the level of Order. 3 outings for the experimental group, 1 outing for the conventional group.

CASE STUDY

Problem solving and case studies on a specific profile of own choice.

SYLLABUS OF CLIMATOLOGY PRACTICES

1. Access to meteorological databases (internet).

2. General climatic analysis of a locality.

3. Calculation of climate indices and climate classification.

4. Methods for estimating evapotranspiration and soil water balance.

Methodology

For each subject of geology and soil science in the following table there are the concepts that must work individually or in team PREVIOUSLY to the class, the exercises of the day that need to work individually or in team as a self-assessment to reinforce the knowledge acquired, and the bibliographic facilities where to find material. The units and complementary information refer to those of: Porta J, López-Acevedo M, Poch RM (2009) Introducció a l'edafologia. Ús i protecció de sòls. Ed. Mundiprensa.

Development plan

Learning activities

Theoretical and practical computer classes and problem solving during school hours.

Laboratory practices

Field practices

Observations

The tutorial system will present the following modalities:

a. Active tutoring: Student attendance is mandatory in internship classes

b. Tutorials to student demand: face-to-face, but preferably using e-mail and the virtual campus.

Evaluation

The grade of the course is calculated as follows: 0.2 [climatology score] + 0.8 [geology + soil science score]

To compensate for a grade between [geology + soil science] and [climatology] you must have obtained at least a four (4) in geology + soil science.

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