



Universitat de Lleida

DEGREE CURRICULUM
SOIL INFORMATION SYSTEMS

Coordination: MARTINEZ CASASNOVAS, JOSE
ANTONIO

Academic year 2023-24

Subject's general information

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|---|---|--------|------------|------------------|
| Subject name | SOIL INFORMATION SYSTEMS | | | |
| Code | 12178 | | | |
| Semester | ANUAL | | | |
| Typology | Degree | Course | Character | Modality |
| | Master's Degree in Soil and Water Management | 1 | COMPULSORY | Attendance-based |
| Course number of credits (ECTS) | 2.5 | | | |
| Type of activity, credits, and groups | Activity type | PRAULA | | TEORIA |
| | Number of credits | 1.6 | | 0.9 |
| | Number of groups | 1 | | 0 |
| Coordination | MARTINEZ CASASNOVAS, JOSE ANTONIO | | | |
| Department | ENVIRONMENT AND SOIL SCIENCES AND CHEMISTRY | | | |
| Teaching load distribution between lectures and independent student work | <p>1. Presentation of the subject. Introduction to Digital Soil Cartography and Soil Information Systems. (2 h)</p> <p>2. Delineation of cartographic units for the differential management of agricultural soils by measuring the CEa with proximity sensors. Exercise. (2 h)</p> <p>3. Design of relational databases. (2 h)</p> <p>4. Exercise on the design of relational databases (2 h)</p> <p>5. Delineation of potential cartographic units of soils through MDT and Remote Sensing. (10 h)</p> <p>6. SIS Raimat study case. (2 h)</p> | | | |
| Important information on data processing | Consult this link for more information. | | | |
| Language | Spanish | | | |
| Distribution of credits | <p>Classes: 2.5 credits (25 hours)</p> <p>Personal work (approximate): 63 hours</p> | | | |

| Teaching staff | E-mail addresses | Credits taught by teacher | Office and hour of attention |
|--------------------------------------|------------------------------|---------------------------|------------------------------|
| GONZALEZ DE AUDICANA AMENABAR, MARIA | maria.audicana@unavarra.es | 0 | |
| MARTINEZ CASASNOVAS, JOSE ANTONIO | joseantonio.martinez@udl.cat | 0 | |

Learning objectives

- Know what soil information systems are.
- Know the methodologies for the structuring of soil information acquired in the field in alphanumeric databases and GIS.
- Apply digital terrain modeling technologies, soil apparent electrical conductivity sensors, GIS and Remote Sensing as support for the delineation of potential cartographic soil units.
- Prepare a SIS of a model area in a GIS environment and establish protocols for consultation and analysis of information for evaluation and planning purposes.

The previous knowledge is common to the module I Inventory and Evaluation of Soils and Territory. It is desirable to know techniques for the analysis of topographic information, analysis of landforms, remote sensing, GIS and relational databases.

Competences

- Ability to structure field information acquired in fields in alphanumeric databases and GIS.
- Ability to apply digital terrain modeling technologies, GIS and Remote Sensing for the analysis of relief and delineation of potential cartographic units of soils.
- Ability to develop a SIS from a model area in a GIS environment and establish protocols for querying and analysis of information for the purpose of evaluation and planning of the territory.

Subject contents

- Presentation of the subject. Introduction to Digital Soil Cartography and Soil Information Systems. Exercise (personal work)
- Design of relational databases.
- Exercise on the design of relational databases.
- Delineation of potential soil cartographic units using DTM and Remote Sensing
- Delineation of cartographic units for the differential management of agricultural soils through ECa measurement with proximity sensors. Exercise.
- SIS case study.

Methodology

The subject is articulated around a case of practical study. In particular, we work with data from an area near

Lleida. In this area, the climate and the original materials are the main conditioning factors of the formation of the soils, their typology and possibilities of use. For the realization of the case study will be used descriptions of soil in the field and other field data already acquired previously in that area. In addition, some exercises are carried out as complementary to the study case.

Development plan

The subject will be developed according to the program and timetable established by the coordination of the master's degree. The detailed program with timetables and topics or practices will be detailed at the beginning of the course on the subject's virtual campus.

Evaluation

The assessment will consist of three blocks or parts:

Block 1) The completion of the exercises, with a weight of 10% of the final mark.

Block 2) Taking an exam on the concepts explained in the theoretical and practical classes, with a weight of 40% of the final grade.

Block 3) Elaboration of an individual report on the SIS developed by the area of the case study, with a weight of 50% of the final grade.

To pass the subject, it is essential to obtain a grade equal to or greater than 5.0 in both block 2 and block 3. These two blocks are recoverable. In the case of the exam, a recovery will be made at a date and time agreed between the students and the teachers. In the case of the case study report, if a grade of less than 5.0 is obtained, the possibility will be given to improve the report according to the observations and/or suggestions of the teaching staff. A maximum period of 10 days will be given to deliver the new version of the report. The maximum mark that will be awarded if the revised report is suitable will be 5.0 (case study report mark).

Alternative assessment:

The UdL's assessment regulations provide for the possibility of being able to carry out an alternative assessment in the event of balancing work or family life, in the cases covered by these regulations. The alternative assessment of this subject will consist of taking the exam on the concepts explained in the theoretical and practical classes, with a weight of 50% of the final grade and of the case study report, with a 50% weight.

Bibliography

Martínez-Casasnovas, J.A., 2010. Bases de datos geo-relacionales. Aplicación al diseño, implementación y consulta de un Sistema de Información de Suelos. Serie: Quaderns DMACS núm. 35, Universitat de Lleida, Departament de Medi Ambient i Ciències del Sòl.