COURSE GUIDE

Soil Technology (20011E5)

Approval date: 19/06/2023

Grado (Bachelor's Degree)	Grado en Biología	Branch	Sciences
Module	Sostenibilidad y Conservación	Subject	Tecnología de Suelos

Year of study	3º	Semester	1º	ECTS Credits	6	Course type	Elective course

PREREQUISITES AND RECOMMENDATIONS

Previous attendance to Química, Medio Físico and Métodos para el estudio del Medio Natural is recommended.

BRIEF DESCRIPTION OF COURSE CONTENT (According to the programme's verification report)

- Soil Quality
- Soil Classification and Use
- Erosion and Desertification
- Soil Conservation and Erosion Control
- Caraterization of contaminated soils
- Remediation of contaminated soils
- Soil Evaluation
- Environmental impacts derived from soil use
- Sustainable soil use

GROUPS:
The course will be imparted in Spanish for the Group B and in English for the Group A.

SKILLS

GENERAL SKILLS

- CG01 - Organisational and planning skills
- CG02 - Teamwork
- CG03 - Applying knowledge to problem solving
- CG04 - Capacity for analysis and synthesis
- CG05 - Knowledge of a foreign language
- CG06 - Critical reasoning
- CG07 - Informatic knowledge regarding the field scope
- CG08 - Self-directed learning for continuous professional development
- CG09 - Oral and written communication in the mother tongue

- CG10 - Decision making
- CG12 - Sensitivity to social and environmental issues
- CG14 - Quality motivation
- CG17 - Information management skills
- CG18 - Interdisciplinary teamwork

SUBJECT-SPECIFIC SKILLS

- CE07 - Catalogue, evaluate and manage natural resources
- CE10 - Conducting thematic cartography
- CE26 - Describe, analyze, evaluate and planificate the physical medium
- CE27 - Diagnose and solve environmental problems
- CE32 - Assess environmental impact
- CE74 - Knowing the energy flows and biogeochemical cycles in ecosystems

LEARNING OUTCOMES

- To acquire a global vision of soil medium and soil degradation processes.
- To know and evaluate erosion processes and their remedial measures.
- To study contamination processes and soil remediation measures.
- To evaluate and quantify soil environmental impacts.
- To plan soil use.

PLANNED LEARNING ACTIVITIES

THEORY SYLLABUS

Lesson I. Soil quality and degradation: soil quality indicators (study of a non-degraded soil). Soil degradation indicators (study of a degraded soil).
Lesson II. Soil erosion. Remedial measures. Forms of soil erosion. Soil erosion evaluation. Soil control.
Lesson III. Soil contamination and remediation. Characteristics of contaminated soils (study of a contaminated soil). Types of soil pollutants. Remediation of contaminated soils (study of remediated soils).
Lesson IV. Soil evaluation and environmental impact: evaluation parameters. Environmental impacts.
Lesson V. Soil use: agricultural and forest soils. Soil-water-plant interactions.

PRACTICAL SYLLABUS

- Practical activities on soil description, classification and evaluation in laboratory, field and with computer programms. Use of AgroMap, AgroSol, ParametricSol and CambioDeUso. All available at: http://edafologia.ugr.es.
    - Interpretation of soil evaluation maps.
    - Interpretation of soil erosion maps.
- Laboratory practice: Phisical and chemical analysis of samples from a soil profile and study of soil erosion and evaluation. Elaboration of a working memory.
- Field practice
    - Forest and agricultural soils

- Degraded soils

RECOMMENDED READING

ESSENTIAL READING

- Aguilar, J.; Martínez, A.; Roca, A. (1996). Evaluación y manejo de suelos. Ed. Univ. Granada.
- Kirby, M.J., Morgan, R.P.C. (1984). Erosión de suelos. Ed. Limusa. México.
- Pierzynsky, G.M., Sims, J.T., Vance, G.F. (2000). Soils and Enviromental Quality. CRC Press. Boca Raton. USA.
- Porta J., López-Acevedo & Roquero C. (2003). Edafología para la agricultura y el medio ambiente (3ª edición). Mundi-prensa.

COMPLEMENTARY READING

- De la Rosa, D. (2008). Evaluación Agro-ecológica de Suelos para el desarrollo rural sostenible. Ediciones Mundi Prensa.
- Porta J., López-Acevedo & Poch R. M. (2008). Introducción a la Edafología. Uso y protección del ed. Mundi-Prensa
- Schaetzl, R.J. y Anderson, S. (2009). Soils. Genesis and geomorphology. Cambridge University Press, Cambridge. 8817 pp.
- IUSS Working Group WRB. (2015). World Reference Base for Soil Resources 2014, update 2015 International soil classification system for naming soils and creating legends for soil maps. World Soil Resources Reports No. 106. FAO, Rome.
- Soil Survey Staff (2014). Keys to Soil Taxonomy. United States Department of Agriculture (USDA) and Natural Resources Conservation Service (NRCS). 12ª edición. Mundiprensa.

RECOMMENDED LEARNING RESOURCES/TOOLS

- DEPARTAMENTO DE EDAFOLOGÍA DE LA UNIVERSIDAD DE GRANADA (http://edafologia.ugr.es). Amplia información sobre los suelos.
- DEPARTAMENTO DE EDAFOLOGÍA DE ETSIA. DE LA LAGUNA (CANARIAS). (http://webpages.ull.es/users/jnotario/CSCA/Index.htm). Página de la asignatura de Edafología (algunos archivos sin acceso libre).
- D.G. Rossiter (Universidad de Twente, Holanda): A compendium of on-line soil survey information (http://www.itc.nl/%5C%5C~rossiter/research/rsrch_ss.html) FAO SOIL PORTAL: http://www.fao.org/soils-portal/en/
- http://www.eea.europa.eu/ (Agencia Europea de Medioambiente)
- http://soils.usda.gov/ (Departamento de Agricultura de los Estados Unidos)

TEACHING METHODS

- MD01 - Lección magistral/expositiva
- MD02 - Sesiones de discusión y debate
- MD03 - Resolución de problemas y estudio de casos prácticos
- MD04 - Prácticas de laboratorio y/o clínicas y/o talleres de habilidades
- MD05 - Prácticas de campo

- MD06 - Prácticas en sala de informática
- MD07 - Seminarios
- MD09 - Análisis de fuentes y documentos
- MD10 - Realización de trabajos en grupo
- MD11 - Realización de trabajos individuales

ASSESSMENT METHODS (Instruments, criteria and percentages)

ORDINARY EXAMINATION DIET

- The Assessment normative can be found in BOUGR núm. 112, de 9 de noviembre de 2016 (http://secretariageneral.ugr.es/bougr/pages/bougr112/_doc/examenes%21).
- The assessment will evaluate the student´s work in the different thematic areas, including seminars and practical activities (soil evaluation, erosion and contamination) as well as exams. In order to pass the course, the student must accomplish all the objectives and competences indicated in this academic guide. All the students have the right to stand for two assessment sessions, one ordinary and one extraordinary.
- The ordinary assessment will follow a continuous assessment system, including the following items:

1. Exams (60%)
2. Seminars/Workshops (15%)
3. Practical activities (25%)

- A minimum 4/10 in every assessable activity will be mandatory in order to be considered for the final grade.

EXTRAORDINARY EXAMINATION DIET

- The students that have not overcome the course in the ordinary assesment session will have an extraordinary assessment session regardless of whether they have previously carried out a continous assessment or not. The final grade will follow the rules indicated in the Academic Guide and, in any case, the posibility of obtaining 100% of the final grade will be ensured for all the students.

SINGLE FINAL ASSESSMENT (evaluación única final)

- The assessment will be preferably continuous. Nevertheless, the students have the opportunity to choose a single final assessment in case they cannot accomplish with the continuous session due to working duties, health problems, disability, mobility programms or any other duly justified matter. In order to benefit from this special assessment, the students must apply to the Head of the Department within the first two weeks of the course indicating the reasons why they cannot follow the continuous assessment. If the application is finally estimated, the final assessment will include two final exams (Theory, 85%; Practice, 15%).

ADDITIONAL INFORMATION

Alternative readings:

- Porta, J., et al. (2019). Edafología. Uso y protección de los suelos. Ed. Mundi-Prensa. Madrid. On line version (free personal identification required)
- Practical Videos in YouTube (UPV)
- Virtual Museum (Edafología UGR)
- Virtual Computer Programms (Edafología UGR)

Links:

- http://edafologia.ugr.es/introeda/tema00/progr.htm
- http://edafologia.ugr.es/programas_suelos/index.htm
- http://edafologia.ugr.es/museovirtual/indice.html
- http://edafologia.ugr.es/comun/enlaces.htm

GROUPS:
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