Universitat de Lleida

DEGREE CURRICULUM

SOIL DEGRADATION PROCESSES AND REHABILITATION

Coordination: RAMOS MARTIN, MARIA CONCEPCION

Academic year 2022-23

Subject's general information

<table>
<tr><td>Subject name</td><td>SOIL DEGRADATION PROCESSES AND REHABILITATION</td></tr>
<tr><td>Code</td><td>12182</td></tr>
<tr><td>Semester</td><td>1st Q(SEMESTER) CONTINUED EVALUATION</td></tr>
<tr><td>Typology</td><td>
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<tr><th>Degree</th><th>Course</th><th>Character</th><th>Modality</th></tr>
<tr><td>Master's Degree in Agronomic Engineering</td><td>2</td><td>OPTIONAL</td><td>Attendance-based</td></tr>
<tr><td>Master's Degree in Soil and Water Management</td><td>1</td><td>COMPULSORY</td><td>Attendance-based</td></tr>
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<tr><td>Course number of credits (ECTS)</td><td>4</td></tr>
<tr><td>Type of activity, credits, and groups</td><td>
<table>
<tr><th>Activity type</th><th>PRACAMP</th><th>PRAULA</th><th>TEORIA</th></tr>
<tr><td>Number of credits</td><td>1.2</td><td>0.6</td><td>2.2</td></tr>
<tr><td>Number of groups</td><td>1</td><td>1</td><td>1</td></tr>
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<tr><td>Coordination</td><td>RAMOS MARTIN, MARIA CONCEPCION</td></tr>
<tr><td>Department</td><td>ENVIRONMENT AND SOIL SCIENCES</td></tr>
<tr><td>Teaching load distribution between lectures and independent student work</td><td>40%: classrrom activities
60% student autonomous work</td></tr>
<tr><td>Important information on data processing</td><td>Consult this link for more information.</td></tr>
<tr><td>Language</td><td>Spanish</td></tr>
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Distribution of credits	Soil and water degradation on a global scale. Desertification. Environmental and economic impacts (MCR 0.2) Erosion degradation: Water erosion: processes and effects. Surface and mass erosion. Sedimentation (MCR 0.4) Soil and water salinization in irrigated land (RP 0.4c) Soil Sodification in irrigated land (RP 0,4c) Soil acidification and contamination (MCR 0.2) Soil conservation measures (RP, 0,4c) Rehabilitation of degraded soils (PPA, 2c) Conservation and rehabilitation measures (2c) Soil conservation measures to reduce erosion, agronomic and mechanical measures. (RP 0.2) Ecological concepts applied to soil rehabilitation. Indicators (JMA 0.3) Rehabilitation of soils affected by erosion and mining (JMA 0.3) Regeneration of burned areas (JMA 0.2) Restoration and revegetation ecotechnologies. Restoration projects (JMA 1)

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
CARABASA CLOSA, VICENÇ	v.carabassa@creaf.uab.cat	1,8	
POCH CLARET, ROSA MARIA	rosa.poch@udl.cat	1	
RAMOS MARTIN, MARIA CONCEPCION	mariaconcepcion.ramos@udl.cat	1,2	

Subject's extra information

Previous knowledge

To study this subject it is necessary to have previous knowledge of physics, chemistry, general edaphology and hydrology

Learning objectives

Objetives:

The students who pass the subject should be able of :

- Identifying and evaluating the main processes of soil degradation and propose suitable soil conservation measures, in particular in highly degraded areas

-Knowing the main causes of water degradation and evaluacion and diagnosis techniques.

Competences

CB1 That students know how to apply the acquired knowledge and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study. CB2 That students are able to integrate knowledge and face the complexity of making judgments based on information that, being incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and judgments. CB3 That students know how to communicate their conclusions -and the knowledge and ultimate reasons that sustain them- to specialized and non-specialized audiences in a clear and unambiguous way. CB4 That students possess the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous.

CE1: Generate and interpret soil and water data. CE4: Control degradation and efficiently use soil and water resources.

CG1 Develop capacities and processes of analysis, synthesis and evaluation, from the acquisition of concepts, calculations, procedures and techniques; CG2 Increase the ability to observe reality, imagination and spatial memory; CG3 Learning to work in a multidisciplinary and multi-objective way; CG4 Train in the generation, analysis, organization and evaluative applications of information of the territory; CG5 Learn in the field and in the laboratory actively, experimentally and in small groups; CG6 Learn to plan, develop, write and present a group work, through a practical case study work; CG7 Learn the dynamics of a work team: decision making, organization and group execution.

CT1 Correction in written oral expression; CT2 Proficiency in a foreign language; CT3 Domain of ICT; CT4 Respect for the fundamental rights of equality between men and women, for the promotion of Human Rights and for the values of a culture of peace and democratic values

Subject contents

Contens

Topic 1. Processes of soil and water degradation. Soil and water degradation on a global scale. Desertification. Environmental and economic impacts (MCR)

Degradation by erosion: Water erosion: processes and effects. Surface and mass erosion. Sedimentation (MCR)

Soil and water salinization in irrigated lands

Sodification soil in irrigated land

Acidification and soil contamination

Degradation of water: acidification, pollution, eutrophication

Topic 2. Diagnosis of soil and water degradation Mapping soil erosion.

Topic 3. Measures conservation and rehabilitation ecological concepts applied to soil rehabilitation. Indicators

Rehabilitation affected by soil erosion and mining

Regeneration of burned areas

Biotechnologies restoration and revegetation.

Activity 1: Solving exercises.

Activity 2: Case study: analysis "in situ" of salinization and sodification (field trip)

Activity 3: Case study: analysis "in situ" of erosion and conservation and rehabilitation measures applied to different problems of soil degradation (field trip)

Methodology

Master class Solving exercices. Study cases. Report and publication revisions. Labd and field work.

Development plan

Tipo de actividad	Descripción	Actividad presencial Alumne		Activdad no presencial Alumne		Evaluación	Ttiempo total	
		Objectius	Hores	Treball alumno	Hores	Hores	Hores	ECTS
Lección magistral	Classe magistral (Aula. Grup gran)	Explicació dels principals conceptes	**20**	Estudio: Conocer y comprender causas y procesos de degradación de suelos y su rehabilitación	**30**	**2**	**52**	**2,08**
Problemas y casos	Classe participativa (Aula. Grup mitjà)	Aplicació dels conceptes teòrics impartits a les classes magistrals	**10**	Resolver problemas y casos	**20**	**3**	**33**	**1,32**
Salida de campo	Visita para ver zonas degradadas y rehabilitacion de suelos	Conocimiento in situ de procesos de degradación y tratamientos	**10**	Informe sobre visita	**5**		**15**	**0,6'**
Totales			**40**		**55**	**5**	**100**	**4**

Evaluation

Activitties to evaluate

Exercises, review and development of practical cases, exercies and concepts explained in class and on field trips will be evaluated.

Type of activity	Evaluation activity		Weight of qualification
	Procedure	Number	(%)
Master class	Tests about concepts explained in the class	**1**	**55**
Problem and case study	Problems and case study (reports)	**Various**	**20**
Field trip	Report based on the filed trip and rehabilitation project	**1**	**25**
Total			**100**

The evaluation tests and delivery of work will be carried out preferably through the virtual campus.To pass the subject it is necessary to present all the reports and have in the exam a grade greater than or equal to 5.

Bibliography

References

Hudson, N. 1982. Conservación del suelo. Reverté. Barcelona

Morgan, R.P.C. 2005. Soil erosion and conservation (3rd edition)

Pierzynski, G.M., J.T. Sims & G.F. Vance. 1994. Soils and Environmental Quality. Lewis Publishers. CRC Press, Boca Raton. Florida.

Schwab, G.O., Fagmeier, D.D., Elliot, W.J., and Frevert, R.K. 1993. Soil and water conservation engineering. 4 ed. Wiley, New York.

Yaron, B., Calvet, R., Prost. R.1996. Soil pollution, processes and dynamics. Springer. Berlin