



Teaching Guide				
Identifying Data				2016/17
Subject (*)	Edafoloxía	Code	610G02045	
Study programme	Grao en Bioloxía			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	2nd four-month period	Fourth	Optativa	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Ciencias da Navegación e da Terra			
Coordinador	Paz Gonzalez, Antonio	E-mail	antonio.paz.gonzalez@udc.es	
Lecturers	Paz Gonzalez, Antonio Vidal Vázquez, Eva	E-mail	antonio.paz.gonzalez@udc.es eva.vidal.vazquez@udc.es	
Web				
General description	<p>La asistencia a las actividades presenciales es obligatoria y la participación activa del alumno en todas las actividades docentes se valorará positivamente en la calificación final.</p> <p>EVALUACIÓN CONTÍNUA</p> <p>Para superar la asignatura, en evaluación continua, será necesario:</p> <ul style="list-style-type: none"> - Haber asistido al menos al 90% de las clases magistrales y seminarios. - Haber realizado y superado las prácticas de laboratorio dentro de los grupos convocados durante el curso. - Haber entregado el Trabajo Fin de Curso. - Obtener una calificación igual o superior a cinco aplicando los criterios que se especifican a continuación: <ul style="list-style-type: none"> o Haber realizado y superado cada uno de los controles. o Controles escritos, seminarios y otras actividades docentes (70%). o Prácticas de laboratorio (20%). o Presentación oral, proyecto y trabajos tutelados (10%) <p>EVALUACIÓN FINAL</p> <p>Aquellos estudiantes que no superen la asignatura mediante la evaluación continua, podrán aprobarla en la convocatoria ordinaria o en la segunda oportunidad con los siguientes criterios:</p> <ul style="list-style-type: none"> - Obtener una calificación igual o superior a cinco aplicando los criterios que se especifican a continuación. <ul style="list-style-type: none"> o Superar el examen final escrito (50%). o Controles escritos, seminarios y otras actividades docentes (30%). o Prácticas de laboratorio (20%). 			

Study programme competences / results	
Code	Study programme competences / results
A1	Recoñecer distintos niveis de organización nos sistemas vivos.
A6	Catalogar, avaliar e xestionar recursos naturais.
A18	Levar a cabo estudos de produción e mellora animal e vexetal.
A20	Muestrear, caracterizar e manexar poboacións e comunidades.
A21	Diseñar modelos de procesos biolóxicos.
A22	Describir, analizar, avaliar e planificar o medio físico.
A23	Avaliar o impacto ambiental. Diagnosticar e solucionar problemas ambientais.
A24	Xestionar, conservar e restaurar poboacións e ecosistemas.
A26	Diseñar experimentos, obter información e interpretar os resultados.
A27	Dirixir, redactar e executar proxectos en Bioloxía.
A28	Desenvolver e implantar sistemas de xestión relacionados coa Bioloxía.



A29	Impartir coñecementos de Bioloxía.
A30	Manexar adecuadamente instrumentación científica.
A31	Desenvolverse con seguridade nun laboratorio.
A32	Desenvolverse con seguridade no traballo de campo.
B1	Aprender a aprender.
B2	Resolver problemas de forma efectiva.
B3	Aplicar un pensamento crítico, lóxico e creativo.
B4	Traballar de forma autónoma con iniciativa.
B5	Traballar en colaboración.
B6	Organizar e planificar o traballo.
B7	Comunicarse de maneira efectiva nunha contorna de traballo.
B8	Sintetizar a información.
B9	Formarse unha opinión propia.
B10	Exercer a crítica científica.
B11	Debater en público.
B12	Adaptarse a novas situacións.
B13	Comportarse con ética e responsabilidade social como cidadán e como profesional.
C1	Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.
C2	Dominar a expresión e a comprensión de forma oral e escrita dun idioma estranxeiro.
C3	Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.
C4	Desenvolverse para o exercicio dunha cidadanía aberta, culta, crítica, comprometida, democrática e solidaria, capaz de analizar a realidade, diagnosticar problemas, formular e implantar solucións baseadas no coñecemento e orientadas ao ben común.
C5	Entender a importancia da cultura emprendedora e coñecer os medios ao alcance das persoas emprendedoras.
C6	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
C7	Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida.
C8	Valorar a importancia que ten a investigación, a innovación e o desenvolvemento tecnolóxico no avance socioeconómico e cultural da sociedade.

Learning outcomes

Learning outcomes	Study programme competences / results		
The program includes environmental impact studies, taken into account soil diversity. Problems driven by soil contamination and soil restoration are also considered.	A1 A6 A20 A21 A28 A31	B5 B8	C3 C6 C7
Because of the role of the soil for terrestrial ecosystems, Edaphology has a particular interest in Environmental Biology. The soil food chain describes a complex living system and how it interacts with the environment, plants, and animals. The nature of soil makes direct observation of food webs difficult. Soil microbial communities are characterized in many different ways. The activity of microbes can be measured by their respiration and carbon dioxide release. The cellular components of microbes can be extracted from soil and genetically profiled, or microbial biomass can be calculated by weighing the soil before and after fumigation.	A6 A20 A22 A26 A29	B3 B6 B10 B11	C1 C5 C6



<p>The course of Soil Science is designed to provide an overview of the fundamental: Physical processes, Chemical processes, Fertility, Biology, and Land Use. Both theoretical and practical contents in soil science should contribute to enhance the skills of Biology students at the UDC in the use of several instrumental techniques.</p>	<p>A1 A18 A21 A27 A31 A32</p>	<p>B1 B5 B7 B8</p>	<p>C2 C3 C7</p>
<p>The scientific study of the soil is important for Biologists, mainly from an ecological perspective. Soil is essential in environmental studies and soil science contributes to understand important processes such as biogeochemical cycles, the structure ecosystems and factors from which primary production depends.</p>	<p>A6 A20 A23 A24 A28 A30</p>	<p>B2 B4 B6 B9 B12</p>	<p>C2 C5</p>
<p>Soils act as substrates for vegetal communities and also as adsorbent and absorbent for nutritive, and allow life of many animal and vegetal organisms. Therefore our program pays particular attention to the "edaphosphere" as a complex dynamic and organised site, located in the interface between biosphere, lithosphere, hydrosphere and atmosphere. Soil is also the support of man-made spaces or sites influenced by man activity, such as urban-industrial areas and transport infrastructures.</p>	<p>A6 A23 A27 A31</p>	<p>B3 B5 B6</p>	<p>C2 C4 C8</p>
<p>El suelo actúa como sustrato de las comunidades vegetales, y soporta la vida de numerosos organismos vegetales y animales. Por tanto, se presta particular atención al análisis de la edafosfera como un medio organizado, complejo y dinámico, en la zona de contacto entre la biosfera, la litosfera, la hidrosfera y la atmósfera.</p>	<p>A1 A18 A21 A23 A30</p>	<p>B2 B4 B6 B13</p>	<p>C2 C4 C7</p>

Contents	
Topic	Sub-topic
<p>PRELIMINARY CONCEPTS Lesson 1.- History of Soil Science. Lesson 2.- Soil description in field conditions. Laboratory techniques for soil studies.</p>	<p>Origin and development of Soils Science. Main topics in Soil Science.</p> <p>Profile and horizons. Physical, Chemical and Biological methods of soil analysis.</p>



<p>SOIL SYSTEMATICS AND CLASSIFICATION Lesson 13.- Soil Systematics. Lesson 14.- Introduction to Soil Taxonomy. Lesson 15.- World Reference Base for Soil Resources. Lesson 16.- Spanish and Galician Soils.</p>	<p>Bulk density and solid density. Soil porosity. Pore-size distribution. Aggregate dynamics in soils. Structural stability.</p> <p>Soil moisture content and soil potential. Soil water measurement. Soil moisture characteristic curve. Soil water retention and soil water dynamics. Soil water and water requirements of vegetation.</p> <p>Soil thermal properties. Soil temperature management. Composition of the soil atmosphere. Soil and gases of greenhouse effect.</p> <p>Soil pH and soil acidity. Soil acidity effects. Acidity amendment. Exchange complex of soils. Cation exchange capacity.</p> <p>Soil organisms. Soil enzymatic activity. Nucleic acids in soil. Soil organism and soil properties as indicators of soil quality.</p> <p>Macronutrients and micronutrients. Nitrogen , phosphorus and potassium cycles. Calcium and magnesium. Iron, copper, zinc, boron and molybdenum. Other oligoelements.</p> <p>Parent material. Climate. Topography. Times Vegetations and organisms. Anthropogenic factors.</p> <p>Soil profile differentiation. Clay accumulation. Podzolization. Salinization. Calcification. Hydromorphic processes. Ferralitic alteration.</p> <p>Genetic and diagnostic horizons. Soil profile. Horizon nomenclature. Modern Soil Classifications. Soil Taxonomy. World Reference Base for Soil Resources.</p> <p>Characteristics for soil diagnosis. Moisture and temperature regimes. Orders, suborders, great groups, subgroups, families, and series.</p> <p>Organic soil. Soil with anthropic influences. Soils conditions by topography and by time. Soils condiciones by cold, temperate, steppe, arid or semiarid and tropical or subtropical climates.</p> <p>Soil under Atlantic climate. Soils under Mediterranean climate. Galician soils: parent material, climate, topography and vegetation effects.</p>
<p>APPLIED SOIL SCIENCE Lesson 17.- Applications of Soil Science.</p>	<p>Soil cartography.</p> <p>Interactions soil-landscape.</p> <p>Soil functions and society.</p> <p>Soil and environment.</p> <p>Soil contamination.</p> <p>Recovery of contaminated soils.</p> <p>Soil Use and Management.</p>



PRACTICAL ACTIVITIES Laboratory Field studies	Textural analysis Bulk density and solid density, Porosity. Aggregate stability Soil pH. Organic carbon and nitrogen Cation exchange capacity Soil extractable phosphorus Biological activity and dehydrogenase activity
COMPULSORY TUTORIAL SUBJECTS	Soil biological quality indicators Soil biodiversity Soil organisms Erosion as a source of diffuse contamination Effect of forest fires on soil degradation Contamination by mining activities Contamination by organic substances Physico-chemical indicators of soil quality Vineyard soils in Galicia Compaction risks Soil water balance Heavy metals in soils Other
FIELD TRIP	Soil Observation Horizon description
Presentation	Presentation Discussion

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student's personal work hours	Total hours
Supervised projects	A6 A18 A20 A21 A22 A26 A29 A30 A31 B2 B3 B10 B13	4	10	14
Document analysis	B1 B4 B5 B6 B12 C1 C2 C7	2	6	8
Oral presentation	A20 A22 B4 B7 C4 C8	2	8	10
Guest lecture / keynote speech	A1 A20 A23 A24 A27 A28 B7 B8 B9 B11 C3 C4 C6	20	40	60
Case study	A1 A18 A32 B2 B12 C3 C1	2	6	8
Research (Research project)	A6 A22 B4 C5 C7	1	8	9
Laboratory practice	A22 A32 B1 C3 C1	14	11	25
Field trip	A1 A20 A22 A30 A32 B1 B4 B10 B11	4	2	6
Personalized attention		10	0	10

(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.



Methodologies	
Methodologies	Description
Supervised projects	Mainly related to application of Soil Science as well as soil classification
Document analysis	Results should be summarized
Oral presentation	Quality and content of the presentation
Guest lecture / keynote speech	Public presentation. Here, the contents of soil science will be developed. The used audiovisual materials will be provided to students.
Case study	Activity related to keynote speech
Research (Research project)	Developed in laboratory and in the field
Laboratory practice	Analysis of basic soil physical, chemical and biological properties.
Field trip	The main soil types in Galicia will be observed.

Personalized attention	
Methodologies	Description
Oral presentation Document analysis Supervised projects	Personalized attention will be provided by individual meetings in dates previously selected.

Assessment			
Methodologies	Competencies / Results	Description	Qualification
Oral presentation	A20 A22 B4 B7 C4 C8	Quality of the reports and presentations.	20
Document analysis	B1 B4 B5 B6 B12 C1 C2 C7	Quality of the documents	30
Supervised projects	A6 A18 A20 A21 A22 A26 A29 A30 A31 B2 B3 B10 B13	Outcome of the projects	50

Assessment comments

Sources of information	
Basic	- Armstrong M, (2004). Basic Linear Geostatistics,. Springer
Complementary	

Recommendations	
Subjects that it is recommended to have taken before	
Xeografía: Xeografía física/610G02006 Xeoloxía/610G02004	
Subjects that are recommended to be taken simultaneously	
Modelos Numéricos de Hidráulica e Contaminación de Medios Porosos/632508010	
Subjects that continue the syllabus	
Other comments	



(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.