



## IDENTIFYING DATA

### Restoration and Environmental Policy

Subject	Restoration and Environmental Policy			
Code	V02M123V01208			
Study programme	(*)Máster Universitario en Ciencias Biolóxicas: Bioloxía Molecular, Computacional e Ambiental e Bio-Industrias			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	1st	2nd
Language				
Department				
Coordinator	Pardo Gamundi, Isabel María			
Lecturers	Deive Herva, Francisco Javier Moldes Moreira, Diego Pardo Gamundi, Isabel María			
E-mail	ipardo@uvigo.es			
Web				
General description	Restauración ecológica de ecosistemas terrestres y acuáticos epicontinentales. Directivas Europeas y legislación ambiental.			

## Competencies

Type A	Code	Competences Specific
	A1	(*)To know the scientific method and the correct use of the scientific terminology as well as to acknowledge the contribution that scientific research provides to the overall knowledge and professional practice.
	A2	(*)Ability to describe and to analyse biological diversity, the mechanisms determining the interactions with the biotic and abiotic environment and being able to select those which might have technical applications.
	A3	(*)Ability to manage and/or to develop basic tools for validating and analysing data by means of statistics and bioinformatics.
	A4	(*)To know the ethical and legal aspects governing the collection and the handling of biological samples, organisms and habitats.
	A5	(*)Ability to design, evaluate and implement models of biological structures, systems and processes.
	A6	(*)To learn the sampling techniques and the instrumental methodologies, in the field and laboratory, for their application in the Biological Sciences
	A7	(*)To have an integrated view of the R&D processes and their possible transfer to the industrial sector. Planning and supervising facilities together with managing their human and economic resources.
	A8	(*)Ability to classify, evaluate, conserve, restore and manage natural and productive systems. Developing and implementing land management and sustainability plans.
	A9	(*)To understand and know how to apply quality control systems and safety protocols in any biological laboratory of the public or private sector.
	A10	(*)To acquire the professional ability to teach and spread Biology and to offer expertise advice for elaborating scientific, technical and socioeconomic biology reports. Address environmental consulting.

A11 (\*)To perform an individual Master Project (critical and in-depth study) under the supervision of a tutor in a research or working environment demonstrating that skills have been acquired.

#### Type B Code Competences Transversal

B1	(*)Dissemination of results and conclusions of the biological studies, in oral and written English, through complex presentations that address ideas related with R&D in Biology.
B2	(*)Managing computational, laboratory, field and industrial techniques in order to obtain, process and apply the acquired information.
B3	(*)Disseminating and broadcasting ideas in contexts both academic and non-specialised.
B4	(*)Reflecting on social and ethical responsibilities.

#### Learning aims

Subject competences	Typology	Competences
(*)Ability to manage and/or to develop basic tools for validating and analysing data by means of statistics and bioinformatics.	know	A3
(*)To know the ethical and legal aspects governing the collection and the handling of biological samples, organisms and habitats.	know	A4
(*)Ability to classify, evaluate, conserve, restore and manage natural and productive systems. Developing and implementing land management and sustainability plans	know	A8
(*)To acquire the professional ability to teach and spread Biology and to offer expertise advice for elaborating scientific, technical and socioeconomic biology reports. Address environmental consulting.	know	A10

#### Contents

Topic	
(a) Environmental regulation on water.	National and European environmental legislation related with the management of aquatic ecosystems.
(b) Restoration of aquatic ecosystems.	Global change and dominant anthropogenic pressures. Impact on the aquatic ecosystem. Restoration practices and examples.
(c) Contaminant emission to the atmosphere.	Contaminant types and classification. Effect on the atmosphere. Fugitive emissions. Emission reduction. Regulations
(d) Remediation of contaminated soils.	Regulations: UE and Spanish regulations. Contaminated soils: legal concentration limits. Soil contaminants. Effects of soil contaminants. Characterization of contaminated soils. Innovative soil remediation technologies.

#### Planning

	Personalized attention	Assessment	Ordinary class hours A	Face-to-face hours outside the classroom Guided academic environment B	Student's work factor C	Outside the classroom hours D	Total hours (A+B+D) E
Master Session	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	16	0	2	32	48
Workshops	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10	0	5.8	58	68
Outdoor study / field practices	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2	0	1	2	4
Projects	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2	0	14	28	30
Total hours E:							150
Work load in UVIGO ECTS credits:							6

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

#### Methodologies

	Description
Master Session	Presentation by the teacher of the contents on the subject under study, theoretical and / or guidelines for a job, exercise or project to be developed by the student.

Workshops	Activities focus on the acquisition of knowledge and manipulative skills and instrumental on a specific theme, with specific assistance from the teacher to the individual activities and / or group to develop students.
Outdoor study / field practices	Activities application of knowledge to specific situations and basic skills acquisition and related procedural matter under study. They thrive in nonacademic outdoor spaces. Among them we can cite practical field visits to events, research centers, companies, institutions ... academic-professional interest to the student.
Projects	Performing activities that allow the cooperation of various subjects and students face, working together, to open problems. Allow coaching, among others, the cooperative learning skills, leadership, organizational, communication and strengthening relationships.

### Personalized attention

	Description
Master Session	Personalized attention in the classroom, email and even telephone
Projects	Personalized attention in the classroom, email and even telephone
Workshops	Personalized attention in the classroom, email and even telephone
Outdoor study / field practices	Personalized attention in the classroom, email and even telephone

### Assessment

	Description	Qualification
Master Session	Involvement and participation	10
Projects	Preparation of a document by the student which reflect the characteristics of the work carried out. Students should describe the tasks and procedures developed, show the results or observations, and the analysis and treatment of data.	90

### Other comments and second call

### Sources of information

Boulding, J.R. (1995). Practical handbook of soil, vadose zone and ground-water contamination: assessment, prevention and remediation. Boca Raton (LA, USA): Lewis Publishers.

Davis, M.L. (2013). Introduction to environmental engineering. 5th ed. New York: McGraw-Hill.

Eiseltová, M. (Ed.). 2010. Restoration of Lakes, Streams, Floodplains, and Bogs in Europe: Principles and Case studies. Springer, Dordrecht. 392 pp.

Eiseltová, M., Biggs J. (Eds.) 1995. Restoration of Stream Ecosystems and integrated catchment approach. IWRB Publication 37. 170 pp.

Eiseltová, M., Å (Ed.) 1994. Restoration of Lake Ecosystems a holistic approach. IWRB Publication 32. 182 pp.

Livingston, R.J. Å (2005). Restoration of Aquatic Systems. CRC Marine Science. CRC Press, 448 pp.

Manahan, S.E (2009). Environmental chemistry. Å 9th ed. Boca Raton, Florida: CRC Press.

Mirsal, I.A. (2004). Soil pollution: origin, monitoring & remediation. Berlin: Springer.

Petts G. y Calow, P. 1996. River Restoration. Blackwell Science. Oxford. 231 pp.

Å van Andel, J. y Aronson, J. (2012). Restoration Ecology: The New Frontier. Wiley-Blackwell.

### Recommendations