



IDENTIFYING DATA

Populación Ecology and Ecosystem Complexity

Subject	Populación Ecology and Ecosystem Complexity			
Code	V02M123V01109			
Study programme	(*)Máster Universitario en Ciencias Biolóxicas: Bioloxía Molecular, Computacional e Ambiental e Bio-Industrias			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	1st	1st
Language	English			
Department				
Coordinator	Kim , Sin Yeon			
Lecturers	García Lago, Liliana Kim , Sin Yeon			
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Web	http://http://webs.uvigo.es/biologicalsciences/			
General description	This course aims to understand: (1) biotic and abiotic factors that shape the structure and complexity of the ecosystems, (2) the mechanisms that mediate life-history trade-offs in organisms, (3) the environment-organism interactions, and (4) organisms' capacity to respond to environmental changes.			

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
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.	know Know How	A1
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.	know Know How	A2
Ability to manage and/or to develop basic tools for validating and analysing data by means of statistics and bioinformatics.	know Know How	A3
Ability to design, evaluate and implement models of biological structures, systems and processes.	know Know How	A5
To learn the sampling techniques and the instrumental methodologies, in the field and laboratory, for their application in the Biological Sciences	know Know How	A6
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 Know How	A10
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.	know Know How	B1
Managing computational, laboratory, field and industrial techniques in order to obtain, process and apply the acquired information.		B2
Disseminating and broadcasting ideas in contexts both academic and non-specialised.		B3
Reflecting on social and ethical responsibilities.		B4

Contents

Topic	
Population ecology	(a) Population dynamics and modelling. (b) From individual behaviour to population ecology. (c) Life-history and population. (d) Environmental factors and phenotypic plasticity.
Ecosystem ecology	(a) Scaling ecology to ecosystems: concepts, structural and functional attributes (b) Big-scale stoichiometry: fluxes of nutrients and detritus across habitats (c) Trophic interactions across scales and ecosystems (d) Biodiversity and ecosystem functioning: current knowledge and future challenges (e) Detecting ecosystem responses to global change

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 type="checkbox"/>	19	0	3	57	76

Outdoor study / field practices	<input type="checkbox"/>	<input type="checkbox"/>	5	0	3	15	20
Workshops	<input type="checkbox"/>	<input type="checkbox"/>	5	0	3	15	20
Reports / memories of practice	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	0	33	33	34
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	Lectures and discussions on the main topics (population ecology: by Sin-Yeon Kim; ecosystem ecology: by Liliana Garcia)
Outdoor study / field practices	In a series of practice sessions, students will learn to design a study based on a scientific question, perform the field study and analyse data.
Workshops	Based on the results obtained from the field study, students will learn to write a scientific report.

Personalized attention

	Description
Master Session	N/A

Assessment

	Description	Qualification
Reports / memories of practice	Participation and outcome of the research practice	100

Other comments and second call

Sources of information

Sutherland, W.J. (1996)., From Individual Behaviour to Population Ecology, , Oxford University Press

Pigliucci, M. (2001). , Phenotypic Plasticity, , Johns Hopkins University Press

Polis, G.A., Power, M.E., & Huxel, G.R. (2004)., Food Webs at the Landscape Level, , University of Chicago Press

Sterner, R.W. & Elser, J.J. (2002). , The Biology of Elements from Molecules to the Biosphere, , Princeton University Press

Vogt, K. (1997)., Ecosystems. Balancing Science with Management, , Springer

Recommendations

Subjects that are recommended to be taken simultaneously

Glogal Change and Adaptation/V02M123V01205

Experimental Design And Data Analyses/V02M123V01102