



IDENTIFYING DATA

Ecology

Subject	Ecology			
Code	O01G261V01602			
Study programme	Grado en Ciencias Ambientales			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	3rd	1st
Teaching language	#EnglishFriendly Spanish			
Department				
Coordinator	Martínez García, Sandra			
Lecturers	Calvo Martín, Elisa Martínez García, Sandra			
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General description	English Friendly subject: International students may request from the teachers: a) materials and bibliographic references in English, b) tutoring sessions in English, c) exams and assessments in English.			

Training and Learning Results

Code	
A3	Students will be able to gather and interpret relevant data (normally within their field of study) that will allow them to have a reflection-based considered opinion on important issues of social, scientific and ethical nature.
A4	Students will be able to present information, ideas, problems and solutions both to specialist and non-specialist audiences.
B1	Students will acquire analysis, synthesis and information-management skills to be applied in the food and agriculture and environmental sectors
B2	Students will acquire and apply teamwork abilities and skills.
C1	To know the physical, chemical and biological foundations linked with the environment and its technological processes
C3	To be familiar with the temporal and spatial dimensions of environmental processes.
C4	Ability to integrate the experimental data found in field and/or lab work with theoretical knowledge.
C6	To be familiar with the different aspects involved in planning, management, assessment and preservation of natural resources.
D1	Capacity of analysis, organization and planning.
D3	COral and written communication in the native language and foreign
D4	Ability of autonomous learning and information management.
D5	Ability of problem solving and decision making
D9	Team of interdisciplinary nature

Expected results from this subject

Expected results from this subject	Training and Learning Results			
Knowledge of the composition, structure and dynamic of the ecosystems, its dependency with the environmental factors to different scales, and its role in the global biogeochemical cycles.	A3	B1	C1	D1
	A4	B2	C3	D3
			C4	D4
			C6	D5
				D9
Interpretation of relevant ecological processes, by using individual and team activities, that include the analysis of data, and the deriving of conclusions	A3	B1	C1	D1
	A4	B2	C3	D3
			C4	D4
			C6	D5
				D9

Contents

Topic	
Subject 1. Ecology and environmental crisis	Limits of the planet and transformation anthropogenic. Organisation of the subject.
Subject 2. The organisms and their environment	Particularities of the physical environment in terrestrial and aquatic ecosystems. Scales of variability in the interaction of physical-biological processes in terrestrial and aquatic ecosystems. Terrestrial and aquatic biomes.
Subject 3. Concept of population and descriptors	Concept of population. Populational parameters: geographic rank, abundance, density, space distribution, dispersion. Quantification of populational parameters. Life Strategies.
Subject 4. Population dynamics	Models of exponential growth. Factors that limit the populational growth. Model of logistical growth. Stochastic behavior. Populational growth in function of the structure of ages. Curves of survival and tables of life.
Subject 5 Interspecific Competition	Types and general characteristics of the trophic interactions. Definition, experimental evidences and types of interspecific competition. Concept of ecological niche and principle of competitive exclusion. Coexistence and environmental heterogeneity. Lotka-Volterra competition model.
Subject 6. Predation and consumption of food	Definition and type of predators. Factors that determine the preferences of diet. Energetic considerations: theory of the optimum procurement, optimum diet and theorem of the marginal value. Types of functional responses and experimental evidences. Numerical responses and of development. Lotka and Volterra predation model
Subject 7. Community structure	Distribution species-abundance. Factors that control the diversity: resources, diversity of habitats, key species and level of perturbation. Trophic structure. Direct and indirect effects: trophic cascades. Bottom-up” and “top-down” control. Relationship between diversity and stability.
Subject 8. Succession	Concept and types of observations . Examples of succession in terrestrial and aquatic ecosystems. Mechanisms of succession: facilitation, tolerance and inhibition Succession, diversity and perturbation
Subject 9. Entrance of energy in the ecosystem: primary production	Gross and net primary production: concept, methods of determination and magnitude. Factors that control primary production. Temporal and spatial variability of primary production. Stoichiometric relations of the organic matter.
Subject 10. Secondary production and organic matter remineralization	Definition of secondary production: herbivorous and detritivore route. Control factors of secondary production. Energetic balance of secondary production: efficiencies. Efficiency, trophic structure and transfer. Decomposition and remineralization of organic matter in terrestrial and aquatic ecosystems. Flow of energy in terrestrial and aquatic ecosystems
Subject 11. Cycles of matter in the ecosystem	Compartments, balance of masses and time of residence. Global carbon global. The role of the ocean in the regulation of climate. Nitrogen global cycle.
Subject 12. Social-ecological systems	Ecosystemic services: offer and demand. Resilience, complexity and efficiency. No linear effects and hysteresis. Management of complex adaptative systems. Principles for the promotion of resilience in social-ecological systems. Urban ecosystems.
Seminar 1. Experimental design	Identification of the factors, the response variable, the experimental unit or the importance of replication and randomization, among other concepts.
Seminars 2 and 3. Data analysis	Interpretation of numerical and graphic data. Management of databases and performance of mathematical calculations or graphic representations
Seminar 4. The diversity concept	Explanation of the concept of biological diversity in the context of Ecology and Environmental Sciences
Seminars 5 and 6. Interpretation of scientific texts	Explanation of complex ecological concepts through the critical analysis of scientific texts.
Seminar 7. Social-ecological systems	Social-ecological systems

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	28	40	68
Seminars	14	10	24
Laboratory practical	5	20	25
Presentation	9	15	24
Objective questions exam	0	4	4
Self-assessment	0	5	5

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

Methodologies	
	Description
Lecturing	Presentation of contents included in the classroom agenda supported with graphic material. This activity will allow students to learn about the composition, structure, and dynamics of ecosystems, their dependence on environmental factors at different scales, and their role in global biogeochemical cycles.
Seminars	Through individual and group activities, the necessary concepts and tools for the design of experimental studies, data analysis and interpretation of results will be introduced. In addition, you will learn to work with complex scientific texts.
Laboratory practical	Introduction of scientific communication methodologies. Learning to carry out oral and poster presentations as well as the preparation of manuscripts.
Presentation	Exhibition of works. Through an activity in which a scientific congress will be simulated, the students will present their work in poster format to the community of teachers and students of the Faculty of Sciences.

Personalized assistance

Methodologies	Description
Presentation	Through individual and group tutorials, the scientific research work and presentation of the work carried out are guided and supervised. During the tutorial hours, the student can solve doubts related to any aspect of the subject. Tutoring sessions will be held in person by appointment

Assessment

	Description	Qualification	Training and Learning Results			
Lecturing	Written exam of objective questions. The comprehension of the contents taught in the classes will be valued.	32.5	A3	B1	C1	
			A4	B2	C3	
					C4	
	Evaluated learning outcome: Knowledge of the composition, structure and dynamics of ecosystems, their dependence on environmental factors at different scales, and their role in global biogeochemical cycles.				C6	
Seminars	Evaluation of deliverables. The ability to solve questions, problems and exercises related to the content taught in the seminars will be valued.	15	A3	B1	C1	D1
			A4	B2	C3	D3
					C4	D4
					C6	D5
	Assessed learning outcome: Introduction to the scientific method and interpretation of relevant ecological processes through individual and group activities, including data analysis, drawing conclusions from data, and guided reading of complex scientific texts					D9
Presentation	Evaluation of the poster prepared in the practical classes and of its oral presentation: The completion of a research project, the preparation of a scientific poster and the clarity and rigor in the exhibition will be valued.	20	A3	B1	C1	D1
			A4	B2	C3	D3
					C4	D4
					C6	D5
						D9
	Evaluated learning outcome: Obtaining capacities to disseminate scientific results orally and in writing					
Objective questions exam	Written exam of objective questions. The comprehension of the contents taught in the classes will be valued.	32.5	A3	B1	C1	
			A4	B2	C3	
					C4	
	Evaluated learning outcome: Knowledge of the composition, structure and dynamics of ecosystems, their dependence on environmental factors at different scales, and their role in global biogeochemical cycles.				C6	

Other comments on the Evaluation

1. CONTINUOUS EVALUATION*

Attendance to class, seminars and practical classes is not mandatory, but attendance at the complete activity of presentation of the practical work (poster session)(date to be set during the first week of class and that will be published in moovi)

First ordinary call

To pass the subject it will be necessary to obtain a score greater than 4 out of 10 in each of the two theory exams of the subject (05/12/2023 and 24/01/2024) and that the average grade of both exceeds 5 out of 10. The average mark of these exams will mean 65% of the final mark. The practical work will represent 20% of the final mark (10% of the group evaluation

of the poster and 10% of the individual evaluation of the presentation of the poster). The activities to be presented after the seminars will account for 15% of the final grade. The evaluation of the deliverables of the seminars requires that all of them are delivered in a timely manner (the non-delivery of any of them will mean that the rest are not evaluated). Carrying out the self-evaluation activities proposed throughout the course through moovi will mean 1 extra point to be added to the final grade. To obtain this point, all activities must be completed in a timely manner.

Second ordinary call

To pass the subject, it will be necessary to obtain a score greater than 5 out of 10 in the second call exam (09/07/2024). The mark of this exam will mean 65% of the final grade. The practical work will represent 20% of the final mark (10% of the group evaluation of the poster and 10% of the individual evaluation of the presentation of the same). The activities to be presented after the seminars will account for 15% of the final grade. The evaluation of the deliverables of the seminars requires that all of them be delivered in a timely manner (the non-delivery of any of them will mean that the rest are not evaluated). Carrying out the self-evaluation activities does not imply extra points in this call.

2. GLOBAL EVALUATION*

Attendance to any class or activity is not mandatory.

The preferred evaluation modality is Continuous Evaluation. Those students who choose the Global Evaluation (100% of the grade in the official exam, 1st call: 24/01/2024, 2nd call: 09/07/2024) must notify the person responsible for the subject, by email or through of the Moovi platform, within a period not exceeding one month from the beginning of the teaching of the subject. Carrying out the self-evaluation activities does not entail extra points in this type of evaluation.

3. END-OF-DEGREE CALL*

Attendance to any class or activity is not mandatory.

The student who chooses to take the exam in the end-of-degree call (official exam 25/09/2023) will be evaluated only with the exam (which will be worth 100% of the grade). If the student does not attend said exam, or fails to pass it, the student will be evaluated in the same way as the rest of the students. Carrying out the self-evaluation activities does not imply extra points in this call.

*En caso de error en la transcripción de las fechas de exámenes, las válidas son las aprobadas oficialmente y publicadas en tablón de anuncios y en la web del Centro. En el caso de cambio de fecha del primer examen de la modalidad de evaluación continua, la nueva fecha será publicada en moovi.

Sources of information

Basic Bibliography

Ricklefs, R.E., **Ecology : The economy of nature**, 7th Edition, WHFreeman, 2014

Rodríguez, J., **Ecología**, 3ª Edición, Pirámide, 2013

Molles, Manuel C., **Ecología : conceptos y aplicaciones**, 3ª Edición, McGraw-Hill, 2006

Begon, M., Harper, J., Towsend, C.R., **Ecology: From individuals to Ecosystems**, 4th Edition, Wiley-Blackwell, 2006

Gotelli, N.J., **A primer of Ecology**, 4th Edition, Sinauer Associates, 2008

Complementary Bibliography

Little C., Willimas G.A., Trowbridge C.D., **The Biology of Rocky Shores (Biology of Habitats)**, 1st Edition, Oxford University Press., 2009

Recommendations
