



1. General information

Course: FUNCTIONAL PLANT ECOLOGY

Type: ELECTIVE

Degree: 340 - UNDERGRADUATE DEGREE PROGRAMME IN ENVIRONMENTAL SCIENCES

Center: 501 - FACULTY OF ENVIRONMENTAL SCIENCES AND BIOCHEMISTRY

Year: 4

Main language: Spanish

Use of additional languages:

Web site:

Code: 37332

ECTS credits: 4.5

Academic year: 2019-20

Group(s): 40

Duration: First semester

Second language: English

English Friendly: Y

Bilingual: N

Lecturer: MARIA BELEN HINOJOSA CENTENO - Group(s): 40				
Building/Office	Department	Phone number	Email	Office hours
Sabatini/0.36	CIENCIAS AMBIENTALES	5470	mariabelen.hinojosa@uclm.es	Martes, miércoles y jueves de 12:00 a 14:00 horas (previa cita por e-mail)
Lecturer: ANTONIO PARRA DE LA TORRE - Group(s): 40				
Building/Office	Department	Phone number	Email	Office hours
ICAM/0.26	CIENCIAS AMBIENTALES	926051400	antonio.parra@uclm.es	Martes, miércoles y jueves de 12:00 a 14:00 (previa cita por e-mail)

2. Pre-Requisites

Not established

3. Justification in the curriculum, relation to other subjects and to the profession

Plant Functional Ecology is a discipline with a high relevance in the field of the Environmental Sciences, given the important role played by plants in ecosystems. This subject contemplates the ecophysiological basics that affect plant distribution in natural or naturalized environments, as well as the analysis of factors affecting the long-term success of plants in a given environment. Therefore, this subject will analyse the functional responses of plants to different stress situations, whether abiotic (water, nutrients, radiation, temperature, pollutants, etc.) or biotic (competition with other plants, herbivory, reactions to pathogens, etc.), with special attention to plant responses to face with adverse situations occurring nowadays, such as climate change, pollution or land-use changes. Moreover, the role of vegetation in carbon fixation and its importance in carbon footprint estimates will be emphasized.

This subject aims to improve the employability of the Environmental Sciences graduates in the field of forestry, agriculture and plant ecology, through the transfer of theoretical concepts and technical field/laboratory training related to the basic aspects of the *Plant Functional Ecology*.

The subject of *Plant Functional Ecology* belongs to the module of scientific bases of the natural environment, and it has a direct relationship with basic and obligatory subjects such as *Biology* and *Ecology*. At the same time, this subject gives a fundamental knowledge that will help to consolidate those contemplated in other optative subjects related to the curricular intensification "Conservation, environmental planning and management" such as *Fire Ecology*, *Aquatic Ecosystems* or *Terrestrial Ecosystems*, besides other matters related with the curricular intensification "Analysis and technologies of the environment" such as *Ecological Restoration*.

4. Degree competences achieved in this course

Course competences

Code	Description
CB01	Prove that they have acquired and understood knowledge in a subject area that derives from general secondary education and is appropriate to a level based on advanced course books, and includes updated and cutting-edge aspects of their field of knowledge.
CB02	Apply their knowledge to their job or vocation in a professional manner and show that they have the competences to construct and justify arguments and solve problems within their subject area.
CB03	Be able to gather and process relevant information (usually within their subject area) to give opinions, including reflections on relevant social, scientific or ethical issues.
CB04	Transmit information, ideas, problems and solutions for both specialist and non-specialist audiences.
CB06	Students have developed the ability to work as a team and lead, direct, plan and supervise multidisciplinary teams
E01	Ability to understand and apply basic knowledge.
E03	Awareness of the temporal and spatial dimensions of environmental processes
E04	Ability to integrate experimental evidence found in field and/or laboratory studies with theoretical knowledge.
E05	Capacity for qualitative data interpretation
E06	Capacity for quantitative data interpretation
E13	Ability to handle software.
G03	Good oral and written communication

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Understand the main functional mechanisms of plants that explain their geographical distribution, and their influence on biogeochemical cycles, particularly

carbon and water.

Analyze the response of plants to the changing conditions of their environment as well as the availability of resources, with special emphasis on situations of environmental stress.

Additional outcomes

Know the main interactions, both positive and negative, of plants with other organisms, and characteristics of the plant that determine or influence such interactions.

Acquire skill in sampling criteria, management of basic research equipment, data preparation and presentation of results related to Plant Functional Ecology.

Make simple observations, ask questions and formulate hypotheses in a student's environment related to Plant Functional Ecology.

6. Units / Contents

Unit 1: Introduction to Plant Functional Ecology

Unit 2: Acquisition and balance of resources: plant adaptations

Unit 2.1 Energy

Unit 2.2 Carbon

Unit 2.3 Water

Unit 2.4 Mineral nutrients

Unit 3: Plant responses to environmental stress

Unit 3.1 Temperature

Unit 3.2 Soils with extreme characteristics

Unit 3.3 Atmospheric pollution

Unit 4: Biotic interactions of plants

Unit 4.1 Plant-plant interactions

Unit 4.2 Plant-organism interactions

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	R	Description
Class Attendance (theory) [ON-SITE]	Lectures	CB01 CB02 CB03 E01 E03 E04 E05 E06	0.76	19	N	-	-	
Analysis of articles and reviews [OFF-SITE]	Reading and Analysis of Reviews and Articles	CB03 E04 E05 E06	0.16	4	Y	N	N	
Workshops or seminars [ON-SITE]	Workshops and Seminars	CB03 CB04 CB06 G03	0.2	5	Y	N	N	
Group tutoring sessions [ON-SITE]	Guided or supervised work	CB03 CB04 CB06 G03	0.08	2	N	-	-	
Other off-site activity [OFF-SITE]	Cooperative / Collaborative Learning	CB03 CB04 CB06 E04	0.64	16	N	-	-	
Study and Exam Preparation [OFF-SITE]	Self-study	CB01 CB02 CB03 E01 E03 E04 E05 E06	1.2	30	N	-	-	
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	CB02 CB03 CB04 CB06 E04 E05 E06 E13 G03	0.6	15	Y	Y	N	
Practicum and practical activities report writing or preparation [OFF-SITE]	Cooperative / Collaborative Learning	E04 E05 E06 G03	0.7	17.5	Y	Y	Y	
Progress test [ON-SITE]	Assessment tests	CB01 CB02 E01 G03	0.08	2	Y	N	N	
Final test [ON-SITE]	Assessment tests	CB01 CB02 E01 E03 G03	0.08	2	Y	Y	Y	
Total:			4.5	112.5				
Total credits of in-class work: 1.8			Total class time hours: 45					
Total credits of out of class work: 2.7			Total hours of out of class work: 67.5					

As: Assessable training activity

Com: Training activity of compulsory overcoming

R: Rescheduling training activity

8. Evaluation criteria and Grading System

Evaluation System	Grading System		Description
	Face-to-Face	Self-Study Student	
Final test	60.00%	0.00%	Two partial exams will be carried out to evaluate the theoretical knowledge acquired. To eliminate matter through partial exams it will be necessary get at least 5 points in each of them. In case of not passing one or both partial exams it will be necessary to take the final exam, in order to be evaluated of the not-passed part (s). The final score of the theoretical part (average of partials and/or final exam) must be at least 5 points to pass this part of the subject.
Practicum and practical activities reports assessment	30.00%	0.00%	The progress in the practical sessions will be evaluated by considering the quality of a written report in terms of methodology, quality of the information provided, analysis and discussion of data, written expression, participation and practical work done.
Other methods of assessment	10.00%	0.00%	The preparation, presentation and discussion of topics presented in seminars, critical analysis of assimilation results,

Total:	100.00%	0.00%	reading articles, etc.
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Evaluation criteria for the final exam:

Two partial exams will be carried out to evaluate the theoretical knowledge acquired. To eliminate matter through partial exams it will be necessary to obtain at least 5 points in each of them. In case of not passing one or both partial exams it will be necessary be to take the final test, in order to be evaluated of the not-passed part (s). The final score of the theoretical part (average of partials and / or final exam) must be at least 5 points to pass this part of the subject. This theoretical part will constitute 60% of the score of the subject.

The final score will be the result of the application of the respective percentages to the qualifications of the theoretical exams (60%), the practice report (30%) and evaluation of other activities such as seminars and reading articles (10%).

Specifications for the resit/retake exam:

The evaluation of the extraordinary call will be made on the basis of a final written exam, whose evaluation will account for up to 70% of the final score. The remaining 30% will correspond to the score obtained in the practical part. In case of not having pass the practical part in the ordinary call it will be necessary to return for evaluation the practice report.

Specifications for the second resit / retake exam:

The evaluation of the special call for completion will be made on the basis of a final written exam, whose evaluation will account for up to 70% of the final score. The remaining 30% will correspond to the score obtained in the practical part.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours
Analysis of articles and reviews [AUTÓNOMA][Reading and Analysis of Reviews and Articles]	4
Workshops or seminars [PRESENCIAL][Workshops and Seminars]	5
Group tutoring sessions [PRESENCIAL][Guided or supervised work]	2
Other off-site activity [AUTÓNOMA][Cooperative / Collaborative Learning]	16
Study and Exam Preparation [AUTÓNOMA][Self-study]	30
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Practicum and practical activities report writing or preparation [AUTÓNOMA][Cooperative / Collaborative Learning]	17.5
Progress test [PRESENCIAL][Assessment tests]	2
Final test [PRESENCIAL][Assessment tests]	2
Unit 1 (de 4): Introduction to Plant Functional Ecology	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Unit 2 (de 4): Acquisition and balance of resources: plant adaptations	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	7
Unit 3 (de 4): Plant responses to environmental stress	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Unit 4 (de 4): Biotic interactions of plants	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Global activity	
Activities	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	19
Analysis of articles and reviews [AUTÓNOMA][Reading and Analysis of Reviews and Articles]	4
Workshops or seminars [PRESENCIAL][Workshops and Seminars]	5
Group tutoring sessions [PRESENCIAL][Guided or supervised work]	2
Other off-site activity [AUTÓNOMA][Cooperative / Collaborative Learning]	16
Study and Exam Preparation [AUTÓNOMA][Self-study]	30
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Practicum and practical activities report writing or preparation [AUTÓNOMA][Cooperative / Collaborative Learning]	17.5
Progress test [PRESENCIAL][Assessment tests]	2
Final test [PRESENCIAL][Assessment tests]	2
Total horas: 112.5	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Fitter, A.H.; Hay R.K.M.	Environmental Physiology of Plants	Academic Press			2002	
Lambers, H.; ChapinIII, F.S.;Pons, T.L.	Plant Physiological Ecology	Springer-Verlag			2008	
Larcher, W.	Physiological Plant Ecology	Springer-Verlag			2003	
Pugnaire, F.I.; Valladares, F.	Handbook of Functional Plant Ecology	Boca Raton: CRC Press/Taylor & Francis Group			2007	
Reigosa, M.J.; Pedrol, N.; Sánchez, A.	La Ecofisiología Vegetal: Una Ciencia de Síntesis	Thomson			2004	
Scott, P.	Physiology and Behaviour of Plants	J. Wiley & sons			2008	

