

**1. General information****Course:** TERRESTRIAL ECOSYSTEMS**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:** 37336**ECTS credits:** 4.5**Academic year:** 2023-24**Group(s):** 40**Duration:** C2**Second language:** English**English Friendly:** Y**Bilingual:** N**Lecturer:** MARIA BELEN LUNA TRENADO - Group(s): 40

Building/Office	Department	Phone number	Email	Office hours
Sabatini/Despacho 033	CIENCIAS AMBIENTALES	926051422	belen.luna@uclm.es	Monday and Friday: 12:00-14:00; Wednesday: 10:00-12:00 (appointment by e-mail) (through appointment by e-mail).

**2. Pre-Requisites**

There are not established pre-requisites.

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

This subject deals with the study of the structure and functioning of terrestrial ecosystems, delving into the different biomes of the Earth. It is an interdisciplinary science, involving knowledge from very diverse fields since from the concept of ecosystem, all the components are associated and the change in one of the components will affect the rest of the components. On the other hand, everything that happens in nature takes place within ecosystems, therefore, it is crucial to have a broad knowledge of them, because this will be the basis for developing good management and conservation strategies as well as for a correct restoration of altered ecosystems.

**4. Degree competences achieved in this course****Course competences**

Code	Description
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.
CB04	Transmit information, ideas, problems and solutions for both specialist and non-specialist audiences.
CB05	Have developed the necessary learning abilities to carry on studying autonomously
E02	Capacity for multidisciplinary consideration of an environmental problem
E04	Ability to integrate experimental evidence found in field and/or laboratory studies with theoretical knowledge.
E06	Capacity for quantitative data interpretation
T03	To use a correct oral and written communication.

**5. Objectives or Learning Outcomes****Course learning outcomes****Description**

To know, of the different compartments of the Earth, its structure, its spatial and temporal variability as well as its main processes.

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.

To apply these concepts to the different ecosystems of the Earth (terrestrial and aquatic), assessing them in relation to the morphological and functional adaptations of the organisms and the functioning of the system as a whole.

Knowledge of the basic aspects related to energy and matter flows in communities.

To know the main actions of man on the structure and global functioning of the planet. Describe the main components of the ecosystem structure and functioning.

To know the main compartments of the planet as well as the main biogeochemical cycles. The Earth as a model of physical-chemical-biological interactions.

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

**6. Units / Contents****Unit 1: Ecosystem concept****Unit 2: Structural components of terrestrial ecosystems****Unit 2.1** Organisms**Unit 2.2** Soil**Unit 3: Ecosystem functioning****Unit 3.1** Productivity**Unit 3.2** Balances of carbon, water and energy**Unit 3.3** Litter decomposition

**Unit 3.4** Nutrient cycling

**Unit 4: Distribution of terrestrial ecosystems**

**Unit 4.1** Factors determining the distribution of terrestrial ecosystems

**Unit 4.2** Herbivory

**Unit 4.3** Fire

**Unit 5: Ecosystems from high latitudes**

**Unit 5.1** Tundra

**Unit 5.2** Boreal forests

**Unit 5.3** High mountains

**Unit 6: Ecosystems from middle latitudes**

**Unit 6.1** Temperate deciduous forests

**Unit 6.2** Temperate evergreen forests and shrublands

**Unit 6.3** Steppes and grasslands

**Unit 7: Ecosystems from low latitudes**

**Unit 7.1** Hot deserts

**Unit 7.2** Savannah and tropical deciduous forests

**Unit 7.3** Rainforests

7. Activities, Units/Modules and Methodology							
Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	CB02 CB05 E02	0.72	18	N		Questions related to each unit will be worked on classes. These questions may be part of the evaluation tests
Study and Exam Preparation [OFF-SITE]	Self-study	CB02 CB04 CB05 E02 E04 T03	1.16	29	N		Autonomous student learning
In-class Debates and forums [ON-SITE]	Debates	CB02 CB04 E02 E04 T03	0.2	5	Y	N	Different topics previously analyzed in scientific papers will be discussed in class
Analysis of articles and reviews [OFF-SITE]	Self-study	CB02 E02 E04	0.58	14.5	N		Students will prepare different works that later will be presented and discussed in class.
Project or Topic Presentations [ON-SITE]	Guided or supervised work	CB02 CB04 E04 T03	0.2	5	Y	N	Students will present different previously proposed works in class.
Writing of reports or projects [OFF-SITE]	Self-study	CB02 CB04 CB05 E02 T03	0.48	12	Y	N	
Mid-term test [ON-SITE]	Assessment tests	CB02 CB04 E02 T03	0.04	1	Y	N	First test that will allow to release matter from the final test.
Final test [ON-SITE]	Assessment tests	CB02 CB04 E02 T03	0.04	1	Y	Y	
Field work [ON-SITE]	Combination of methods	CB02 CB05 E02 E04	0.2	5	Y	Y	On the first day of practice sessions, a field sampling will be carried out. In addition, a field trip to S <sup>a</sup> Guadarrama or Gredos will be scheduled. Field sampling is part of the practices, so attendance to these sessions is considered as a compulsory and non-recoverable activity to be able to pass the subject.
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	CB02 CB05 E02 E04 E06	0.4	10	Y	Y	Attendance at practices is considered as a compulsory and non-recoverable activity to pass the subject. The evaluation through a report will be recoverable, either in the final or resit/retake exams. The balance of C and N of a holm oak forest will be analyzed during the practice sessions.
Practicum and practical activities report writing or preparation [OFF-SITE]	Combination of methods	CB02 CB04 CB05 E02 E04 T03	0.48	12	Y	Y	The practices will be evaluated through a report writing.
<b>Total:</b>			<b>4.5</b>	<b>112.5</b>			
<b>Total credits of in-class work: 1.8</b>				<b>Total class time hours: 45</b>			
<b>Total credits of out of class work: 2.7</b>				<b>Total hours of out of class work: 67.5</b>			

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System			
Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Mid-term tests	24.50%	0.00%	A mid-term assessment will be carried out around the middle of the semester. Passing this exam will mean the release of these contents in the final exam

Theoretical papers assessment	14.00%	0.00%	Learning will be consolidated through the development of works.
Oral presentations assessment	7.00%	0.00%	Oral presentations of topics related to the main biomes of the world.
Practicum and practical activities reports assessment	30.00%	30.00%	Report with scientific format.
Final test	24.50%	70.00%	Final test with a weight of 24.5% for students who have passed the partial test. The final test will have a weight of 49% for those students who have not released contents in the partial test.
<b>Total:</b>	<b>100.00%</b>	<b>100.00%</b>	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences).

#### Evaluation criteria for the final exam:

##### Continuous assessment:

Theory will be evaluated through partial and final tests, and different works throughout the course. It will contribute 70% to the final grade.

The practical part will be evaluated by means of a practice report and will contribute to the final grade by 30%.

The practices and theory must be passed in order to pass the subject, being a 4 the minimum grade that students must obtain. In any case, the subject will only be considered passed if the set of all evaluable activities results in a grade of 5 or higher (out of 10).

##### Non-continuous evaluation:

By default, students are enrolled in the continuous assessment mode. The change to the non-continuous evaluation mode can be requested, in an email to the professor, before the end of the class period.

The theoretical part will be evaluated by means of a final test.

The practical part will be evaluated by means of a practice report that will be presented on the date of the ordinary call and will contribute to the final grade by 30%.

The practices and theory must be passed in order to pass the subject, being a 4 the minimum grade that students must obtain. In any case, the subject will only be considered passed if the set of all evaluable activities results in a grade of 5 or higher (out of 10).

#### Specifications for the resit/retake exam:

There are no particularities for the resit/retake exam, following the same criteria than for the final exam.

#### Specifications for the second resit / retake exam:

The theoretical part will be evaluated through a final test that will contribute 70% to the final grade. Likewise, the practical part will be evaluated through a test that will contribute 30%.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours
Final test [PRESENCIAL][Assessment tests]	2
Field work [PRESENCIAL][Combination of methods]	5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	10
Practicum and practical activities report writing or preparation [AUTÓNOMA][Combination of methods]	12
Unit 1 (de 7): Ecosystem concept	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	1
Study and Exam Preparation [AUTÓNOMA][Self-study]	1.5
Unit 2 (de 7): Structural components of terrestrial ecosystems	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	3
In-class Debates and forums [PRESENCIAL][Debates]	1
Analysis of articles and reviews [AUTÓNOMA][Self-study]	8.5
Unit 3 (de 7): Ecosystem functioning	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Study and Exam Preparation [AUTÓNOMA][Self-study]	8
In-class Debates and forums [PRESENCIAL][Debates]	4
Analysis of articles and reviews [AUTÓNOMA][Self-study]	6
Unit 4 (de 7): Distribution of terrestrial ecosystems	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	3
Unit 5 (de 7): Ecosystems from high latitudes	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.5
Project or Topic Presentations [PRESENCIAL][Guided or supervised work]	1
Writing of reports or projects [AUTÓNOMA][Self-study]	4
Unit 6 (de 7): Ecosystems from middle latitudes	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.5
Project or Topic Presentations [PRESENCIAL][Guided or supervised work]	2
Writing of reports or projects [AUTÓNOMA][Self-study]	4

Unit 7 (de 7): Ecosystems from low latitudes	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.5
Project or Topic Presentations [PRESENCIAL][Guided or supervised work]	2
Writing of reports or projects [AUTÓNOMA][Self-study]	4
Global activity	
Activities	hours
Analysis of articles and reviews [AUTÓNOMA][Self-study]	14.5
Project or Topic Presentations [PRESENCIAL][Guided or supervised work]	5
Final test [PRESENCIAL][Assessment tests]	2
Field work [PRESENCIAL][Combination of methods]	5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	10
Practicum and practical activities report writing or preparation [AUTÓNOMA][Combination of methods]	12
In-class Debates and forums [PRESENCIAL][Debates]	5
Writing of reports or projects [AUTÓNOMA][Self-study]	12
Class Attendance (theory) [PRESENCIAL][Lectures]	18
Study and Exam Preparation [AUTÓNOMA][Self-study]	29
Total horas: 112.5	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Aber, J. y Melillo, J.	Terrestrial ecosystems.	Harcourt College Publishers.			1991	
Chapin, F.S. III, Matson, P.A. y Mooney, H.A.	Principles of Terrestrial Ecosystem Ecology.	Springer-Verlag.			2002	
Schultz, J.	The ecozones of the world	Springer			2005	
Walter, H.	Zonas de vegetación y clima.	Omega.			1977	
Ågren, G.I. y Andersson, F.O.	Terrestrial Ecosystem Ecology: Principles and Application	Cambridge University Press			2012	
Canadell, J.G., Pataki, D.E. y Pitelka, L.F.	Terrestrial Ecosystems in a changing world	Springer-Verlag		978-354032729	2011	
Wang, Y.	Terrestrial Ecosystems and Biodiversity	CRC Press, Taylor & Francis Group		978-1032474427	2020	