



1. General information

Course: FIRE 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: 37333

ECTS credits: 4.5

Academic year: 2023-24

Group(s): 40

Duration: First semester

Second language: English

English Friendly: Y

Bilingual: N

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	Tuesday, Wednesday and Thursday from 12:00 to 14:00 (appointment by e-mail). The schedule will be updated in the Virtual Secretary if necessary.

Lecturer: IVAN TORRES GALAN - Group(s): 40

Building/Office	Department	Phone number	Email	Office hours
Sabatini/0.35	CIENCIAS AMBIENTALES	5472	ivan.torres@uclm.es	Monday 12:00 to 14:00, wednesday 10:00 to 12:00, thursday 12:00 to 14:00. Emailing in advance for confirmation is advised.

2. Pre-Requisites

Not established

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

Fire Ecology is a subject that complements the profile of future graduates in Environmental Sciences and provides them with the knowledge they need for proper management of the natural environment, given the importance of fire in Mediterranean ecosystems. It studies the phenomenon of forest fires from an environmental perspective, analysing the change in the fire regime due to anthropic activity and climate change, as well as the response of species and communities of flora and fauna to fire. It has important applications in the field of land management, protected areas, in the preparation of restoration plans for burnt areas, etc.

It belongs to the subject of Ecology and is closely related to subjects such as Ecology, Functional Ecology of Plants and Ecological Restoration.

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.
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.
E01	Ability to understand and apply basic knowledge.
E02	Capacity for multidisciplinary consideration of an environmental problem
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
E07	Capacity to plan, manage and conserve natural resources
E12	Ability to manage Geographic Information Systems
E13	Ability to handle software.
E18	Capacity to manage the natural environment
E20	Capacity to plan and carry out actions to restore the natural environment
T01	To know a second foreign language.
T02	To know and apply the Information and Communication Technologies (ICT).
T03	To use a correct oral and written communication.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Understand the physical and chemical processes of the combustion phenomenon.

Know the risk factors that determine the occurrence of fires.

Acquire basic criteria and techniques useful for the management of ecosystems affected by fires.
 Know the techniques and measures for fire prevention and firefighting.
 Understand the phenomenon of forest fires, their global significance and their role in ecosystems.
 Understand the responses of organisms, ecosystems and landscapes to fire.

6. Units / Contents

Unit 1: Introduction: Fire as an ecological disturbance

Unit 2: The phenomenon of fire

- Unit 2.1 Occurrence and risk of wildfires
- Unit 2.2 Physics and chemistry of combustion
- Unit 2.3 Plant fuels
- Unit 2.4 Fire behaviour and modelling

Unit 3: Impacts of fire on organisms and ecosystems

- Unit 3.1 Plants and their response to fire
- Unit 3.2 Ecophysiology of plants and fire
- Unit 3.3 Plants and the fire regime
- Unit 3.4 Plant communities and fire
- Unit 3.5 Effects of fire on animals

Unit 4: Other impacts of fire, fire management, restoration of burned ecosystems

- Unit 4.1 Effects of fire on soil and water
- Unit 4.2 Fire management.
- Unit 4.3 Restoration of burned areas

ADDITIONAL COMMENTS, REMARKS

Laboratory practicals:

1. Simulation of a fire and its characteristics in the burn room.
2. Fuel models and simulation of fire behaviour
3. Fire severity assessment in the field
4. Mechanisms of plant persistence after fire (resprouting, germination of seeds)

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	E01 E02 E03 E07 E18 E20 T01	0.8	20	N	-	Master classes. All the teaching material used will be available to students on the Virtual Campus platform.
Study and Exam Preparation [OFF-SITE]	Self-study	CB03 E01 E02 E03 E05 E06 T01	1	25	N	-	Autonomous learning
Workshops or seminars [ON-SITE]	Combination of methods	CB02 CB04 E13 E20 T01 T02 T03	0.28	7	Y	Y	Work assignments on selected topics
Other off-site activity [OFF-SITE]	Self-study	CB03 E01 E02 E03 E05 E06 E20 T01 T02 T03	0.8	20	N	-	Time dedicated to do the work assignments
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	CB03 E01 E02 E03 E04 E05 E06 E07 E12 E13 E18	0.6	15	Y	Y	Practicals in the burning room, field (if circumstances allow) and computer room. Attendance at practical sessions is compulsory and, due to their nature, cannot be made up.
Practicum and practical activities report writing or preparation [OFF-SITE]	Self-study	CB02 CB03 CB04 E01 E02 E03 E04 E05 E06 E12 E13 T03	0.9	22.5	Y	Y	Writing of lab and field work reports
Mid-term test [ON-SITE]	Assessment tests	CB03 E01 E02 E03 E05 E06 E20 T03	0.04	1	Y	N	Mid-semester progress test that will take into account the theoretical knowledge of part of the subject.
Final test [ON-SITE]	Assessment tests	CB03 E01 E02 E03 E05 E06 E20 T03	0.08	2	Y	Y	Final test
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 (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-semester progress test which will eliminate material for the

Mid-term tests	30.00%	0.00%	final exam, as long as a mark of 4 or higher (out of 10) is obtained.
Final test	30.00%	75.00%	In the continuous assessment mode, there will be a mid-term test of the subject. In order to eliminate the material it will be necessary to obtain at least a 4 out of 10. In case of not passing the partial test, or opting for non-continuous assessment, it will be necessary to take the whole subject in the final test. The final exam will take into account the theoretical content of the subject and the activities worked on in class.
Other methods of assessment	15.00%	0.00%	Evaluation of work assignments
Practicum and practical activities reports assessment	25.00%	25.00%	Evaluation of lab and field work report. It is compulsory and can be presented either in spanish or english
Total:	100.00%	100.00%	

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:

Students will be assigned by default to the continuous assessment program. Any student can request transfer to the non-continuous evaluation (before classes have ended) by sending an email to the professor, as long as the student has not taken part of 50% of assessable activities (classes, work assignments, etc.).

Students who pass the mid-term test with at least 4 points (out of 10) will only have to be tested for the contents of the second half of the semester in the final test.

All evaluation activities must be passed independently with at least 4 points (out of 10). Nevertheless, students will only pass if their final mark is over 5 points, averaged over all activities according to the weights in the table above.

Non-continuous evaluation:

Only the final test (75%) and lab/field report (25%) will be considered.

All evaluation activities must be passed independently with at least 4 points (out of 10). Nevertheless, students will only pass if their final mark is over 5 points, averaged over all activities according to the weights in the table above.

Specifications for the resit/retake exam:

Those evaluation activities that were not passed (less than 4 points) will be evaluated again. If the mid-term of final test (second half of the contents) have been passed, it will not be necessary to retake that part. The final mark must be 5 or higher (out of 10).

Specifications for the second resit / retake exam:

Those evaluation activities that were not passed (less than 4 points) will be evaluated again. The final mark must be 5 or higher (out of 10).

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours
Study and Exam Preparation [AUTÓNOMA][Self-study]	25
Workshops or seminars [PRESENCIAL][Combination of methods]	7
Other off-site activity [AUTÓNOMA][Self-study]	20
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	22.5
Mid-term test [PRESENCIAL][Assessment tests]	1
Final test [PRESENCIAL][Assessment tests]	2
Unit 1 (de 4): Introduction: Fire as an ecological disturbance	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Unit 2 (de 4): The phenomenon of fire	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	7
Unit 3 (de 4): Impacts of fire on organisms and ecosystems	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	8
Unit 4 (de 4): Other impacts of fire, fire management, restoration of burned ecosystems	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Global activity	
Activities	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	20
Study and Exam Preparation [AUTÓNOMA][Self-study]	25
Workshops or seminars [PRESENCIAL][Combination of methods]	7
Other off-site activity [AUTÓNOMA][Self-study]	20
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Mid-term test [PRESENCIAL][Assessment tests]	1
Final test [PRESENCIAL][Assessment tests]	2
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	22.5
Total horas: 112.5	

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Arnaldos, J., et al.	Manual de ingeniería básica para la prevención y extinción de incendios forestales	Mundi-Prensa			2004	
Bond, W.J. y Van Wilgen, B.W.	Fire and Plants	Springer			1996	
Keeley, J.E., et al.	Fire in Mediterranean Ecosystems	Cambridge University Press			2012	
Pausas, J.G.	Incendios Forestales, una introducción a la ecología del fuego	CSIC			2012	
Vélez, R.	La defensa contra incendios forestales: fundamentos y experiencias	McGraw-Hill			2000	
Whelan, R.J.	The Ecology of Fire	Cambridge University Press			1995	