



POLITÉCNICA

INTERNATIONAL
CAMPUS OF
EXCELLENCE

COORDINATION PROCESS OF
LEARNING ACTIVITIES
PR/CL/001



E.T.S.I. Montes, Forestal y
Medio Natur.

ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

133000278 - Management And Restoration Of Mediterranean Forests

DEGREE PROGRAMME

13AD - Master Universitario En Ingenieria De Montes

ACADEMIC YEAR & SEMESTER

2025/26 - Semester 1

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1. Description

1.1. Subject details

Name of the subject	133000278 - Management And Restoration Of Mediterranean Forests
No of credits	3 ECTS
Type	Optional/elective
Academic year of the programme	First year
Semester of tuition	Semester 1
Tuition period	September-January
Tuition languages	English
Degree programme	13AD - Master Universitario en Ingenieria de Montes
Centre	13 - E.T.S.I. Montes, Forestal Y Medio Natur.
Academic year	2025-26

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Raquel Benavides Calvo (Subject coordinator)		raquel.benavides@upm.es	Sin horario. No specific timetable. Must be arranged with the teacher
Jose Alfredo Bravo Fernandez		alfredo.bravo@upm.es	Tu - 10:00 - 14:00 W - 12:00 - 14:00

Juan Antonio Oliet Pala		juan.oliet@upm.es	Sin horario. No specific timetable. Must be arranged with the teacher
Sonia Roig Gomez		sonia.roig@upm.es	Tu - 10:00 - 14:00 Th - 10:00 - 12:00 Also arranged by email
Jesus Fernandez Moya		jesus.fmoya@upm.es	Sin horario. No specific time. Must be arranged with the teacher

* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

3. Prior knowledge recommended to take the subject

3.1. Recommended (passed) subjects

The subject - recommended (passed), are not defined.

3.2. Other recommended learning outcomes

- Botany
- Plant ecophysiology
- Forest mensuration
- Soil science and geology
- Ecology

4. Skills and learning outcomes *

4.1. Skills to be learned

CB07 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

CE 6.1 - Capacidad para la gestión de recursos naturales

CT01 - Habilidades de comunicación escrita y oral

CT08 - Creatividad, capacidad de observación, generación de hipótesis y planteamiento de problemas experimentales

4.2. Learning outcomes

RA162 - Conocer cómo utilizar la información disponible en la toma de decisiones en gestión forestal.

RA160 - Conocer y saber emplear las herramientas para la gestión forestal sostenible disponibles para las masas españolas

RA161 - Conocer y analizar los principales esquemas selvícolas de las especies forestales más relevantes en España.

* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

5. Brief description of the subject and syllabus

5.1. Brief description of the subject

The Mediterranean region is a biodiversity hotspot, harbouring a wide variety of landscapes, ecosystems and species. This is due not only to its rich natural heritage, but also to the seamless interaction between humans and the environment that has existed since ancient times. However, the Mediterranean area is also one of the European regions most vulnerable to climate change. In line with Goal 15 of the Sustainable Development Goals, protecting, restoring and promoting the sustainable use of these ecosystems is therefore a priority.

Forest management and restoration are key disciplines for natural environment managers and landscape planning professionals. These disciplines integrate knowledge of ecosystem functioning and its interaction with human activity, combining information on ecosystem description, the legacy of disturbances, current limitations and natural dynamics, together with an in-depth understanding of societal needs. In Spain, forest land covers over 50% of the total area (approximately 27.9 million hectares), including 18 million hectares of wooded land (36% of the total). These figures illustrate the significant scope of these disciplines in this region.

This course provides an introduction to the main ecological factors that drive natural dynamics in Mediterranean ecosystems and reviews the historical management of forests and old plantations, i.e. the first restoration attempts, that have shaped the current ecosystems and landscapes. We then focus on particularly relevant or unique forest ecosystems, providing descriptions and the main silvicultural guidelines for paradigmatic ecosystems such as 'dehesas' or cork oak stands. The course concludes with a discussion of the main restoration strategies and relevant methods for restoring degraded areas in a Mediterranean context.

5.2. Syllabus

1. Introduction: ecological and historical factors in Mediterranean forests
 - 1.1. Mediterranean ecosystems: main ecological factors
 - 1.2. Mediterranean ecosystems: Iberian forests and shrublands
 - 1.3. Historical factors modelling forest landscape
 - 1.3.1. Historical facts and forest landscape degradation
 - 1.3.2. Counteracting degradation: forestations plans in recent history
2. Cultural Mediterranean ecosystems
 - 2.1. An introduction to silvicultural systems
 - 2.2. Mediterranean forest ecosystems: description and management
 - 2.2.1. Silvopastoral systems
 - 2.2.2. Cork oak woodlands
 - 2.2.3. Coppice forests
 - 2.2.4. Mediterranean natural pine stands
 - 2.2.5. Conversion of planted forest: promoting resilience and biodiversity
3. Restoration of Mediterranean ecosystems
 - 3.1. Restoration strategies
 - 3.2. Restoration methods

6. Schedule

6.1. Subject schedule*

Week	Type 1 activities	Type 2 activities	Distant / On-line	Assessment activities
1	Lesson 1 Duration: 01:30 Lecture	Introduction to the course Duration: 00:30 Lecture		
2	Lesson 2 Duration: 02:00 Lecture			Assignment L1 and L2 Written test Progressive assessment Presential Duration: 00:10
3	Lesson 3 Duration: 01:00 Inverted classroom Lesson 3 Duration: 01:00 Lecture			Assignment L3 Individual presentation Progressive assessment Presential Duration: 00:10
4		Field trip Duration: 08:00 Practice field trip		Questionnaire about the field trip Written test Progressive assessment and Global Examination Presential Duration: 00:10
5	Lesson 4 Duration: 02:00 Lecture			
6	Lesson 5 Duration: 02:00 Lecture			Assignment L 4 and 5 Written test Progressive assessment Presential Duration: 00:10
7		Field trip (optional) Duration: 08:00 Practice field trip		Questionnaire Written test Progressive assessment Presential Duration: 00:10
8	Lesson 6 Duration: 02:00 Lecture			Assignment L6 Written test Progressive assessment Presential Duration: 00:10
9	Lesson 7 Duration: 01:00 Lecture Lesson 8 Duration: 01:00 Lecture			Assignment L7 and L8 Written test Progressive assessment Presential Duration: 00:10

10	Lesson 9 Duration: 02:00 Lecture			Lesson 9 Written test Progressive assessment Presential Duration: 00:10
11	Lesson 10 Duration: 02:00 Lecture			Assignment L10 Written test Progressive assessment Presential Duration: 00:10
12	Lesson 11 Duration: 02:00 Lecture			Assignment L 11 Individual work Progressive assessment Presential Duration: 00:10
13	Lesson 12 Duration: 02:00 Lecture			Assignment L 11 and 12 Written test Progressive assessment Presential Duration: 00:10
14				
15				
16				
17				Final test Written test Progressive assessment Presential Duration: 03:00 Final test Written test Global examination Presential Duration: 03:00

Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27 hours of student face-to-face contact and independent study time.

7. Activities and assessment criteria

7.1. Assessment activities

7.1.1. Assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
2	Assignment L1 and L2	Written test	Face-to-face	00:10	6%	5 / 10	CT08 CT01
3	Assignment L3	Individual presentation	Face-to-face	00:10	6%	5 / 10	CB07 CT01
4	Questionnaire about the field trip	Written test	Face-to-face	00:10	10%	5 / 10	CB07 CE 6.1
6	Assignment L 4 and 5	Written test	Face-to-face	00:10	6%	5 / 10	CT01
7	Questionnaire	Written test	Face-to-face	00:10	6%	5 / 10	CB07 CE 6.1
8	Assignment L6	Written test	Face-to-face	00:10	6%	5 / 10	CT08
9	Assignment L7 and L8	Written test	Face-to-face	00:10	6%	5 / 10	CB07 CT01
10	Lesson 9	Written test	Face-to-face	00:10	6%	5 / 10	CE 6.1
11	Assignment L10	Written test	Face-to-face	00:10	6%	5 / 10	CB07
12	Assignment L 11	Individual work	Face-to-face	00:10	6%	5 / 10	CT08
13	Assignment L 11 and 12	Written test	Face-to-face	00:10	6%	5 / 10	CE 6.1
17	Final test	Written test	Face-to-face	03:00	30%	5 / 10	CB07 CT08 CT01

7.1.2. Global examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
4	Questionnaire about the field trip	Written test	Face-to-face	00:10	10%	5 / 10	CB07 CE 6.1
17	Final test	Written test	Face-to-face	03:00	90%	5 / 10	CB07 CT08 CT01

7.1.3. Referred (re-sit) examination

No se ha definido la evaluación extraordinaria.

7.2. Assessment criteria

Evaluation criteria

A seamless and personal follow-up of the evolution and learning progress of students will be addressed.

Progressive evaluation

To pass the course, the student has to attend one of the two scheduled field trips, and complete a questionnaire, which will account for 10% of the mark.

Throughout the semester, short individual assignments or questionnaires on each topic (8?10 in total) will account for 60% of the mark. At least, two-thirds of them should be handed in.

A final in-class test will account for 30% of the mark. The format and structure of the test will be previously set in Moodle.

Global Evaluation

To pass the course, the student has to attend one of the two scheduled field trips, and complete a questionnaire, which will account for 10% of the mark.

A final in-class test will account for 90% of the mark. The format and structure of the test will be previously set in Moodle.

8. Teaching resources

8.1. Teaching resources for the subject

Name	Type	Notes
Loidi (ed) 2017. The Vegetation of the Iberian Peninsula. Volume 1. Springer. 676pp	Bibliography	
Pemán García, J.; Navarro, R.M.; Aránzazu Prada Sáez, M.; Serrada Hierro, R. (Coords.) 2021 Bases técnicas y ecológicas del proyecto de repoblación forestal Ministerio para la Transición Ecológica y el Reto Demográfico. Madrid. Tomo II, 546 pp.	Bibliography	Manual actualizado con todas las técnicas y aspectos operativos para el diseño de replantaciones con especies leñosas
SMITH, D.M.; LARSON, B.C.; KELTY, M.J.; ASHTON, P.M. 1997. The practice of silviculture: applied forest ecology. John Wiley & sons. New York. 9ª Ed.	Bibliography	
SERRADA, R.; MONTERO, G.; REQUE, J.A. 2008. Compendio de Silvicultura Aplicada en España. Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria. Fundación Conde del Valle de Salazar. Madrid	Bibliography	
DIÉGUEZ, U. et al. 2009. Herramientas selvícolas para la gestión forestal sostenible en Galicia. DG de Montes. Consellería do Medio Rural, Xunta de Galicia. 260 pp.	Bibliography	

<p>REQUE. J.A.; BAYARRI, E.; SEVILLA, F. 2013. Diagnóstico selvícola. Universidad de Valladolid- Profor. Valladolid.</p>	<p>Bibliography</p>	
<p>SERRADA, R. 2011. Apuntes de Selvicultura. Fucovasa. Madrid. 571 p.</p>	<p>Bibliography</p>	
<p>Oliver, C.D.; Larson, B.C.1996. Forests stand dynamics. McGraw- Hill. NY, 540 pp</p>	<p>Bibliography</p>	
<p>NYLAND, R.D. 2016 Sylviculture. Concepts and applications Mc. Graw- Hill Series in Forest Resources. 682 pp.</p>	<p>Bibliography</p>	
<p>MATTHEWS, J.D. 1989 Sylvicultural systems. Oxford University Press. Oxford Science Publications</p>	<p>Bibliography</p>	
<p>Alía Miranda, R.; Alba Monfort, N.; Agúndez Leal, D. 2005. Manual para la comercialización y producción de semillas y plantas forestales. Materiales de base y de reproducción. Organismo Autónomo Parques Nacionales. Ministerio de Medio Ambiente</p>	<p>Bibliography</p>	
<p>Pemán García, J.et al. 2012-13. Producción y Manejo de semillas y plantas forestales. Tomo I Naturaleza y parques nacionales. Serie Forestal. Ministerio de Agricultura, Alimentación y Medio Ambiente.</p>	<p>Bibliography</p>	<p>Disponibles en http://www.magrama.gob.es/es/parques-nacionales-oapn/publicaciones/naturaleza-parques.aspx</p>
<p>Cortina, J.; Peñuelas, J.L.; Puértolas, J.; Savé, J.; Vilagrosa, A. (Coords.). 2006. Calidad de planta forestal para la restauración en ambientes mediterráneos degradados. Estado actual de conocimientos. Ministerio</p>	<p>Bibliography</p>	

de Medio Ambiente		
Peman, J.; Navarro, R.M. 1998. Repoblaciones Forestales. Ediciones de la Universidad de Lleida. Lleida	Bibliography	
Serrada, R. 2000. Apuntes de Repoblaciones Forestales. Fundación Conde del Valle de Salazar. EUITF. Madrid	Bibliography	
Junta de Castilla y León. 2015. Requerimientos técnicos. Forestación y creación de superficies forestales. Junta de Castilla y León. 66 pp	Bibliography	
Centro de Mejora Forestal El Serranillo:	Web resource	http://www.magrama.gob.es/es/biodiversidad/temas/montes-y-politica-forestal/recursos-geneticos-forestales/CNMF_serranillo.aspx
Federación Española de Viveristas Forestales	Web resource	 http://www.federacionviveros.es/
Reforestación, Viveros y Recursos Genéticos del Servicio Forestal Americano:	Web resource	http://www.rngr.net/
Inventario de Tecnologías de Lucha Contra la Desertificación	Web resource	http://www.magrama.gob.es/es/biodiversidad/temas/desertificacion-y-restauracion-forestal/lucha-contra-la-desertificacion/lch_inventario_tec.aspx
http://secforestales.org	Web resource	Sociedad Española de Ciencias Forestales. Informes, Cuadernos de la SECF, Actas de congresos, Buscador de publicaciones. Recursos en abierto
https://www.miteco.gob.es/es/biodiversidad/temas/inventariosnacionales/default.aspx	Web resource	Forest inventories

http://secforestales.org/content/glosario-tecnico-forestal	Web resource	Glosario forestal de la SECF
Archivo fotográfico y de presentaciones. Archivo supuestos prácticos y casos.	Others	
Viveros de la UD Selvicultura y Repoblaciones	Equipment	Invernadero y umbráculo
Laboratorio U.D. Selvicultura y Repoblaciones.	Equipment	Cámaras de germinación, campo de prácticas. Invernaderos y umbráculo.

9. Other information

9.1. Other information about the subject

The language of the course will be English, although technical vocabulary will be also given in Spanish in order to help the students understand basic concepts in Spanish and a better integration into the academic environment.

Two field trips will be offered together with the course 'Selvicultura General' (GIF), being one of them mandatory and the other one optional. In situ basic translations will be given of the comments done by the professionals that will guide the trip.

The Unit provides students with the tools, laboratories and greenhouses to carry out research work for Master Theses or internships