



Universitat de Lleida

# DEGREE CURRICULUM **SYLVICULTURE**

Coordination: AUNOS GOMEZ, ALVARO IGNACIO

Academic year 2023-24

**Subject's general information**

<b>Subject name</b>	SYLVICULTURE			
<b>Code</b>	102437			
<b>Semester</b>	2nd Q(SEMESTER) CONTINUED EVALUATION			
<b>Typology</b>	<b>Degree</b>	<b>Course</b>	<b>Character</b>	<b>Modality</b>
	Bachelor's Degree in Forest Engineering	3	COMPULSORY	Attendance-based
	Double degree: Bachelor's degree in Forest Engineering and Bachelor's degree in Nature Conservation	3	COMPULSORY	Attendance-based
	Master's Degree in Forestry Engineering		COMPLEMENTARY TRAINING	Blended learning
<b>Course number of credits (ECTS)</b>	6			
<b>Type of activity, credits, and groups</b>	<b>Activity type</b>	PRACAMP	PRAULA	TEORIA
	<b>Number of credits</b>	0.5	1.7	3.8
	<b>Number of groups</b>	5	1	1
<b>Coordination</b>	AUNOS GOMEZ, ALVARO IGNACIO			
<b>Department</b>	AGRICULTURAL AND FOREST SCIENCES AND ENGINEERING			
<b>Important information on data processing</b>	Consult <a href="#">this link</a> for more information.			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
AUNOS GOMEZ, ALVARO IGNACIO	alvaro.aunos@udl.cat	8	

## Learning objectives

### 3. Learning objectives and outcomes

The pedagogical approach of this subject is based on the development of the three substantial aspects that make up professional competence:

1. The acquisition of technical knowledge (knowledge): to pass the subject, the student must know the fundamentals and the management of forestry treatments applicable to wooded areas.
2. The development of capacities (know-how): to pass the subject, the student must have acquired sufficient capacity to:
  - diagnose the state of different forest masses and the inherent problems that they may present
  - interpret, from a written text, the mass structure that is described
  - fluently handle, at the user level, some growth models (production tables)
  - program and justify quantitatively clearing, pruning and regeneration treatments, and reasonably select the most suitable application methods under different circumstances and location conditions, management objectives, species, age of the trees, etc.
  - base, formalize and rank the different alternatives that are considered in decision-making
3. The assumption of attitudes in the face of difficulties that arise in professional practice (knowing how to be). This objective, undoubtedly the most delicate to achieve, will be instrumentalized by guiding and correcting the student's attitude in the academic sphere and by exposing exemplary events that are known from the forestry sector.

## Competences

### General skills

CB1. That students have demonstrated to possess and understand knowledge in an area of study that starts from the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that imply knowledge coming from the forefront of your field of study.

CB2. That students know how to apply their knowledge to their work or vocation in a professional way and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.

CB3. That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include reflection on relevant issues of a social, scientific or ethical nature.

CB4. That students can transmit information, ideas, problems and solutions to both specialized and non-specialized audiences

In addition, the graduate must have acquired:

CG2. Ability to analyze the ecological structure and function of forest systems and resources, including landscapes.

CG6. Ability to measure, inventory and evaluate forest resources, apply and develop silvicultural techniques and management of all types of forest systems, parks and recreational areas, as well as techniques for the use of timber and non-timber forest products.

CG7. Ability to solve technical problems derived from the management of natural spaces.

CG13. Ability to design, direct, prepare, implement and interpret projects and plans, as well as to write technical reports, recognition reports, evaluations, expert opinions and appraisals.

CG15. Correction in oral and written expression

## Specific skills

The graduate in Forest Engineering after completing their studies will have acquired the following knowledge and skills:

CEMC11. Silviculture.

## Subject contents

### Temary

In order to promote a rational and coherent development of the teaching subject and also facilitate the precise identification of the contents assigned to each part, the discipline taught is structured in the ten topics that are indicated below, together with their study load, and that They are grouped into three didactic units.

### **Didactic Unit I: Partial treatments**

1. Introduction to Silviculture and glossary of terms (1 hour)
2. Cleaning and thinning (1 h)
3. Thinning.- Fundamentals, types of thinning, definition of a thinning regime, criteria to regulate the intervention, effects of thinning (17 h)
4. Growth modeling: production tables (5 h)
5. Foundations and practice of pruning.- Types of pruning, guiding pruning, objectives of pruning to clean the stem, technical nature and economic content of the operation, choice of trees to come, tools and pruning systems ( 7 h)

### **Didactic Unit II: General regeneration treatments**

7. Shelterwood method.- The natural sequence of regeneration, the historical process of regeneration fellings, preparatory, disseminatory, secondary cuts, formation of the sections, practical aspects of their application, general assessment of the system (6 h)
8. Modalities of shelterwood method: uniform system, group system, by strips and bands, application ranges of successive thinning in Spanish species (4 h)
9. Uneven-aged silviculture: selection cutting.- Organization of selection cutting, evaluation of individual tree selection, variants of selection cutting, group selection system, applications, the current called "close-to-nature silviculture" ( 14 h)
10. Clear cutting: modalities and execution.- Definition and conditions of application, form and arrangement of the field portion, advantages and disadvantages of the method, seed-tree method, masses with reserve (3 h)

## Didactic Unit III: Particular applications of silvicultural treatments

11. Management of beech forests.- Historical uses and exploitation of beech trees, temperament and artificial regeneration, partial silvicultural treatments, general regeneration treatments and management methods, genetic improvement (2 h)

## Methodology

Theoretical classes will be held in the classroom, with abundant presentation of slides, on the basic foundations and forestry techniques contemplated in the exposed program. The techniques will be particularized by describing the forestry of some relevant species that offer undoubted didactic character (fir, black pine, etc.). In addition, students have didactic material made up of compulsory and recommended reading, and photocopies of transparencies explained in class.

The learning of skills or abilities ("sphere of know-how") will be developed, regardless of the eminently practical approach under which the theoretical classes are taught, through four types of complementary activities:

1. Resolution in the classroom of a total of eight practical cases of a general and integrative nature, and that students are asked to first try to solve them on their own. The teacher reserves the right to demand, in a particular way, the written presentation by the student of the outline or draft of the solution they have proposed.

Apart from these assumptions that will be solved in the classroom, they are also provided with three other exercises already solved, as well as a collection of systematized and practical problems, required in previous exams but without the solution incorporated.

2. Making two trips to the mountain with the following destinations:

- a. Castillonroy: March 8, 2021 or March 15 (distance: 35 km); content: practice of egg whites (6 hours in the morning only).
- b. Val d'Aran: from May 25 to 28 both inclusive (distance: 190 km) in the context of a coordinated four-day trip with the subjects Mount and Industry, Wildlife Management and Forestry Works; content: improvement treatments and thinning cuts, logging, visit to a wildlife park, hydrological-forest correction works, etc., with a full dedication of four full days.

The trips, paid in full by the ETSEA, will be carried out in vehicles with less than 9 seats. For this, the five official ETSEA cars (34 seats) and those provided by the teachers are available. The objective of such trips is for the student to become involved in forestry practice and management, and at the same time become familiar with the different mass structures.

3. Preparation, in a small group and according to the guidelines of the Project to carry out a silvicultural treatment.... that appears in the teaching material available, of a Project (with Memory, Budget and Specification of particular Technical Conditions) on the silvicultural treatments that were analyzed in the internship trip to Castillonroy on March 8 or 15.

4. Seminar activity, individualized for each group, in order to debate the document mentioned in the previous point:

- Date determined by the teacher in the period from March 17 to 24 (both inclusive).
- Expected duration: 2 hours.

## Evaluation

**Attendance is not mandatory** in any of the proposed activities.

It is recommended to go to the teacher's office, requesting individualized or small group tutorials, to resolve doubts as they arise. In the two days prior to the exams, doubts will not be solved in a personalized way, but only through a collective class on a date to be decided.

The subject can be passed by:

- a. Continuous assessment.
- b. Recovery exam.

The continuous evaluation will be carried out through the following process:

- a. Carrying out, throughout the semester, **various (between 3 and 7) control activities**. It is a sine qua non condition, to be able to pass the continuous assessment, that the arithmetic mean of the grades obtained in the set of these tests is greater than 5 points out of 10. The content and dates will be specified later.
- b. **Written exam** on the content of Didactic Unit I (corresponds to the 1st continuous assessment exam), to be carried out on April 12. Computation in the final grade: **4 points**.
- c. **Written exam** on the remaining topics of the program (Didactic Units II and III - 2nd continuous assessment exam), to be carried out on June 11. Computation in the final grade: **3.5 points**.

The final grade of this continuous evaluation will be obtained from the numerical marks assigned in the previous tests b) and c) (**7.5 points in total**), plus the evaluation deserved by the student (**maximum 2.5 points**) in the aspects following:

- i. Results of the control activities carried out
- ii. Attitude and degree of commitment (attendance and interest shown in the proposed activities, participation in the questions raised in class, personal behavior, writing documents and exams, etc.)

In order to average the grades obtained in tests b) and c), it is necessary to have achieved a grade higher than 3 points out of 10 in each of them.

Passing ( $\geq 5$  points out of 10) of any of the written tests mentioned in sections b) and c) above releases its content for the recovery exam, in the event that it had to be taken.

## Bibliography

It consists essentially of some Teaching Notes of the subject (available in the copy shop in Spanish and in Catalan) that collect the theoretical basis, although with a marked applied approach, of almost all the topics covered in the program. On the Sakai platform, other documents of a didactic nature are offered, such as readings and PowerPoint presentations of some classroom lessons.

To support the explanations given in the classroom, they also have the notes compiled by a student in previous courses and which are incorporated into the Sakai platform under the title: Técnicas Selvícolas\_Pardo; This document, illustrated with neat drawings and graphics, complements the content of the Teaching Notes. Clarifications on other concepts that may have been confusing in the classes can be contrasted in: SERRADA R. 2011. Apuntes de Silvicultura. Fundación Conde del Valle de Salazar . Madrid. 502 pp. (available in the Library on paper).

This material is complemented with recommended readings (some issued on paper and others incorporated into the

platform) and a collection of questions put in official exams.

## **Basic bibliography**

BARRIO, M., CASTEDO F., MAJADA J., HEVIA A., 2008. Manual básico de la poda y formación de los árboles forestales. Mundi-prensa, Madrid, 255 pp.

LANIER L., 1994. Précis de sylviculture. ENGREF. Nancy. 478 pp.

SCHÜTZ J.P., 1997. Sylviculture 2. La gestion des forêts irrégulières et mélangées. Presses polytechniques et universitaires Romandes. Laussane. 178 pp.

SERRADA R., MONTERO G., REQUE J., (eds), 2008. Compendio de Selvicultura Aplicada en España. INIA, Madrid. 1.178 pp.

## **Complementary bibliography**

DIÉGUEZ U., ROJO A., CASTEDO F., ALVAREZ J.G., BARRIO, M., CRECENTE F., GONZÁLEZ J.M., PÉREZ C., RODRÍGUEZ R., LÓPEZ C., BALBOA M.A., GORGOSO J.J., SÁNCHEZ F., 2009. Herramientas selvícolas para la gestión sostenible en Galicia. Xunta de Galicia, Lugo. 259 pp.

GONZALEZ J.M., 2005. Introducción a la Selvicultura General. Universidad de León. 309 pp.