



Universitat de Lleida

# DEGREE CURRICULUM **FOREST BOTANY**

Coordination: CONESA MOR, JOSEP ANTONI

Academic year 2022-23

Subject's general information

<b>Subject name</b>	FOREST BOTANY			
<b>Code</b>	102415			
<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	1	COMPULSORY	Attendance-based
	Double degree: Bachelor's degree in Forest Engineering and Bachelor's degree in Nature Conservation	1	COMPULSORY	Attendance-based
<b>Course number of credits (ECTS)</b>	9			
<b>Type of activity, credits, and groups</b>	<b>Activity type</b>	PRACAMP	PRALAB	TEORIA
	<b>Number of credits</b>	1.5	1.2	6.3
	<b>Number of groups</b>	3	3	1
<b>Coordination</b>	CONESA MOR, JOSEP ANTONI			
<b>Department</b>	HORTICULTURE, BOTANY AND LANDSCAPING			
<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
CONESA MOR, JOSEP ANTONI	josepantoni.conesa@udl.cat	9,2	
ROYO ESNAL, ARITZ	aritz.royo@udl.cat	5,2	

## Subject's extra information

### See the different sections in the top horizontal menu

In addition to these general regulations, at the beginning of the course it will be published on the Virtual Campus (Resources) and in the place of this subject regulations and information of interest to all students. This information will contain aspects related to the outings, field practices, course work and the topics that will be evaluated in each of the three planned theoretical partials.

## Learning objectives

- O1. Know the most relevant aspects of plant biology, as well as the main factors of distribution of plant species.
- O2. Delimit the field of Botany, comparing the traditional plant kingdom with more modern and phylogenetic views of living things.
- O3. Show the great diversity of types of organization present in living things gathered under the name of plants.
- O4. Show the internal and external organization of the upper plants in the different vegetative and reproductive organs.
- O5. Relate the internal organization of the plants with the external organization, as well as the solutions adopted in different environmental conditions.
- O6. To offer an ordered vision of the organisms that compose the kingdom of the metaphits, in order to show the great existing diversity.
- O7. Introduce and recognize those plants, especially within the Spermatophytes, that have a greater forest interest.
- O8. Identify the different biotic and physical elements of the natural environment and their interrelationships.
- O9. Understand the importance and ecological value of the different physical and biotic elements of the natural environment.
- O10. Provide the theoretical concepts essential for the study of vegetation.
- O11. Show the variation of the plant landscape —with special reference to forest communities— and its relationship with environmental factors.
- O12. Present plant resources of economic importance, with special emphasis on those that are different from wood and its derivatives.

O13. Know the existing legislation applicable both to the protection of species and habitats and to non-timber forest uses.

O14. Write memoirs and descriptive reports on flora and vegetation.

O15. Use methodologies and apply them to perform an ecological characterization of a region.

## Competences

### General skills

CG1. Ability to understand the biological foundations for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and uses in the forestry field.

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

CG3. Ability to design, direct, prepare, implement and interpret projects and plans, as well as to write technical reports, recognition reports, assessments, appraisals and appraisals.

CG4. Ability to understand, interpret and adopt scientific advances in the field of forestry, to develop and transfer technology and to work in a multilingual and multidisciplinary environment.

CG5. Correction in oral and written expression.

CG6. Mastery of information and communication technologies.

CG7. Knowledge of the biological bases and foundations of the plant field in engineering.

### Specific skills

CE1. Ability to recognize and differentiate the main Iberian forest species.

CE2. Ability to know the main techniques to be able to identify plant species of vascular flora. Use of dichotomous keys.

CE3. Ability to recognize the main plant formations and main indicator species or characteristics.

CE4. Ability to analyze some plant resources and propose management and conservation measures. CE5. Ability to search for information regarding the protection of plant species and other related regulations

## Subject contents

### Block I: Introduction (7 h)

Topic 1. Definition of Botany. Historical development of Botany as a science. Botanical disciplines. Relations of Botany with Forest Sciences. Taxonomic situation of plants in the context of living organisms.

Item 2. Systematic botany and taxonomy. Classification systems. Botanical nomenclature and taxonomic ranges. Species concept. Large divisions of metaphytes.

Topic 3. Levels of plant organization. Corm adaptations. The alternation of nuclear phases and generations. Biological cycles.

Topic 4. Fungi. General characteristics: organization, physiology and nutrition, and morphology. Mycorrhizae. Main groups of fungi and economic importance. Biological cycles.

Item 5. Algae and lichens. General characteristics of algae. Biological cycles. Major groups of algae and economic importance. Fungal and algal symbiosis: lichens. Importance of lichens.

Item 6. Bryophytes and Pteridophytes. General characteristics of bryophytes and pteridophytes. Ecology and economic and forestry interest groups. Spermatophytes. General characteristics.

## **Block II: Anatomy and plant morphology (16 h)**

Item 7. Basic organization of vascular plants. Meristematic tissues and parenchymal tissues. Mechanical tissues: collenchyma and sclerenchyma. Conductive tissues: xylem and phloem. Epidermis and periderm.

Topic 8. The stem. Functions. External morphology and internal structure. Adaptations.

Topic 9. The leaf. Functions. External morphology and internal structure. Adaptations.

Topic 10. The rel. Functions. External morphology and internal structure. Adaptations.

Topic 11. The flower. Parts and modifications of the corolla. Androecium and gynoecium. Pollen grain and seminal primordium, Types of flowers and floral representation.

Item 12. Inflorescences. Particular types and inflorescences.

Item 13. Sexual reproduction in spermatophytes. Concept and phases.

Item 14. Pollination, fertilization and embryonic development.

Item 15. The fruit. Morphology and classification.

Item 16. The seed. Characteristics. Dormition, viability and germination. Block III: Plant systematics of upper plants (5 pm)

## **Block III: Systematic (17 h)**

Item 17. Spermatophytes (I). Gymnosperms: General characteristics. Life cycle. Classification.

Item 18. Spermatophytes (II). Gymnosperms: Cicadaceae, Ginkgoaceae, Pinaceae, Cupressaceae.

Item 19. Spermatophytes (III). Gymnosperms: Taxodiaceae, Taxaceae, Ephedraceae

Item 20. Spermatophytes (IV). Angiosperms: General characteristics. Life cycle. Classification. Differences between dicotyledons and monocotyledons.

Item 21. Spermatophytes (V). Angiosperms: Phages, Betulaceae, Tiliaceae.

Item 22. Spermatophytes (VI). Angiosperms: Ulmaceae, Cystaceae, Tamaraceae.

Item 23. Spermatophytes (VII). Angiosperms: Salicaceae, Ericaceae, Rosaceae.

Item 24. Spermatophytes (VIII): Fabaceae, Buxaceae, Ramnaceae.

Item 25: Spermatophytes (IX): Angiosperms: Aceraceae, Oleaceae, Lamiaceae.

Item 26 Spermatophytes (X). Angiosperms: Honeysuckle, Asteraceae.

Item 27 Spermatophytes (XI). Angiosperms: Arecaceae, Poaceae, Liliaceae.

## **Block IV: Geobotany and Vegetation (12 h)**

Item 28. Biogeography (I): Area of distribution of a taxon. Chorological element and floristic territory. Endemisms. Barriers and biogeographical factors.

Item 29. Biogeography (II): Biogeographic realms of the earth. Phytogeographic regions. Large vegetation units in the world.

Item 30. Vegetation. Plant communities. Concept of plant community. Potential, current and permanent vegetation. Dynamics of plant communities. Primary communities and secondary communities. Plant succession.

Item 31. Phytocenology in the study of vegetation. The Braun-Blanquet method. Concepts related to plant communities and the landscape.

Item 32. Vegetation of Spain (I): the evergreen, deciduous and aciculifolia Iberian forests. The canary laurisilva.

Item 33. Vegetation of Spain (II): shrub and herbaceous formations: shrubs, moors, pastures.

Subject 34. Vegetation of Spain (III): the vegetal communities of special places.

Item 35. Practical applications of the study of plant communities: The Habitats Directive and the preparation of technical reports

## **Block V: Forest uses (10 h)**

Item 36. Use and management of hypogeous and non-hypogeous edible mushrooms.

Item 37. Use and management of medicinal, aromatic and condimentary plants.

Item 38. Use and management of beekeeping plants.

Item 39. Other forest uses (dyeing plants, tanneries, barrels, baskets, boxwood, heather, hawthorn and palm).

Item 39. Forest lands and social use. Conservation of biological diversity.

## **Practical activities**

### **Laboratories / Arboretum**

- Use of dichotomous keys for the determination of vascular flora species.

- Recognition of species of pinaceae, cupressaceae and taxaceae.
- Morphological description of organs in exemp.
- Recognition of species of phages, birches, lindens, elms, cystacea, heather, rosacea, fabaceae, buxaceae, ramnaceae, aceraceae, oleaceae, lamiaceae, honeysuckle, asteraceae, lilyaceae and poaceae.

## Departures

- Visit to the Dr. Pius Font i Quer Arboretum and Botanical Garden of Lleida.
- Field trip to La Pena (Serra de Prades): recognition of Mediterranean and sub-Mediterranean forest species. Notions of geobotany.
- Field trip following a south-north route - Pre-Pyrenees-Val d'Aran: recognition of sub-Mediterranean, Euro-Siberian and boreal-alpine forest species.

## Course work and preparation of the herbarium

The course work that will consist of the study of a specific territory in which a report will have to be elaborated - memory and a herbarium. The technique for making the herbarium will be explained in a regular classroom cabinet session.

## Methodology

### Learning activities

- Theoretical classes that will alternate with laboratory practices (six sessions) and field trips (two one-day outings and a third of less than half a day).
- Activities aimed at reviewing concepts and setting content will be encouraged in the classroom.

The initial consideration is that all the activities led by teachers are face-to-face, although depending on the incidence of the COVID19 pandemic at the time of the development of the subject, they can be virtualized. In the event of a serious incident, the face-to-face theoretical contents will be limited to a few sessions or classes, and the rest will be taught through Virtual Campus tools. The practical laboratory classes will be developed, if the incidence of the pandemic is not serious, with half face-to-face group and half virtual group, in order to reduce the number of students of each group by half, and will alternate consecutively in each practice. However in serious situation they will be virtual. As for field trips they will be kept face-to-face, but keeping students at a distance from each other. In the event of a serious incident, the exits will be made virtual.

The distribution of the teaching load is as follows:

Theory teaching:	hhhhhhhh	hhhhhhhh
Block I: Introduction	7 h	
Block II: Plant anatomy and morphology	16 h	

Block III: Plant systematics	17 h	
Block IV: Geobotany and Vegetation	12 h	
Block V: Forest uses	10 h	
Subtotal		62 h
Teaching practical laboratory classes	12 h	
Teaching practical field classes	15 h	
Subtotal		27 h
Exams	1 h	
TOTAL:		90 h

## Development plan

### Methodological axes of the subject

#### Learning activities

- Theoretical classes that will alternate with laboratory practices - observation of plants in the Arboretum (six sessions) and field trips (two one-day outings and a third of less than half a day).

- In the classroom, activities aimed at reviewing concepts and setting content will be encouraged.

The initial consideration is that all activities led by teachers are face-to-face, although depending on the incidence of the COVID19 pandemic during the course of the course, they may be virtualized. In the case of a serious incident, the theoretical content will be limited to a few sessions or classes, and the rest will be taught through the tools of the virtual Campus. The practical laboratory classes will be developed, if the incidence of the pandemic is not serious, with half a face-to-face group and half a virtual group, in order to reduce the number of students in each group by half, and they will alternate consecutively in each practice. However, in the case of many infections they will be virtual. As for the field trips, they will be kept in person, but keeping the students at a distance from each other. In the event of a serious incident, the departures will be made virtual.

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Subtotal		62 h
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Subtotal		27 h
Exams	1 h	
TOTAL:		90 h

## Tests and exams

The tests will be face-to-face, only in the case of a serious incidence of the COVID-19 the different parts of theory and the visual will be carried out virtually through the instruments that the Virtual Campus makes available.

## Evaluation

	Objectives ----- Learning results	Criteria/ observations (score 1 to 10)	Weight qualifications (%)
<b>Recognition visu: Organs and plant species</b>	O6, O7, O8	Overcome prove: 6 points	<b>30</b>
<b>Written exams: Parcial 1 Parcial 2 Parcial 3</b>	O1, O2, O3, O4, O5 O6,O7,O8,O9 O10, O11,O12, O13	Overcome proves: 5 points	<b>20</b> <b>20</b> <b>20</b>
<b>Course work</b>	O6, O7, O8, O9, O11, O12, O13, O14, O15		<b>10</b>
<b>Total</b>			<b>100</b>

## Bibliography

### Basic Bibliography

BOLÒS, O., VIGO, J.; MASALLES, R.M. & NINOT, J.M. (1990). *Flora manual dels Països Catalans*. Ed. Pòrtic. Barcelona.

CONESA, J.A. (2000). *Altres aprofitaments forestals*. Eines, 40. Universitat de Lleida. 377 pàg.

CONESA, J.A. (2016). *Plantes del bosc de ribera de les Terres de Lleida. Llenyoses i enfiladisses*. Hamadriades, 1. Publicacions de l'Arborètum-Jardí Botànic de Lleida. 149 pàg.

CONESA, J.A., PEDROL, J. & RECASENS, J. (2010). *Estructura i organització de plantes superiors*. Eines, 68. Universitat de Lleida. 245 pàg.

CONESA, J.A, PEDROL, J. & RECASENS, J. (2014). Itineraris botànics per les Terres de Lleida (Les Garrigues, la Noguera, el Pla d'Urgell, la Segarra, el Segrià i l'Urgell). Trajectes, 3. Pagès editors. Lleida. 279 pàg.

FOLCH, R. (1981). *La vegetació dels Països Catalans*. Ketres ed. Barcelona.

FONT QUER, P. (1979). *Iniciació a la Botànica* (2a edició a cura d'O. de Bolòs). Ed. Fontalba. Barcelona, 262 pàg.

HEYWOOD, V. H. (1985). *Las plantas con flores*. Ed. Reverté, SA. Barcelona, 332 pàg.

IZCO, J., E. BARRENO, M. BRUGUÉS, M. COSTA, J. DEVESA, F. FERNÁNDEZ, T. GALLARDO, X. LLIMONA, E. SALVO, S. TALAVERA, & B. VALDÉS (1997). *Botánica*. Ed. Mc. Graw-Hill Interamerica, 781 pàg.

<http://botanicavirtual.udl.cat> - On this website you will find a supplement to the information that the subject's teachers can provide you from classrooms, laboratories or field trips.

## Supplementary Bibliography

CONESA, J.A. (1997). *Tipologia de la vegetació: anàlisi i caracterització*. Eines, 19. Universitat de Lleida. 407 pàg.

FONT QUER, P. (1953). *Diccionario de Botánica*. Ed. Labor. Barcelona, 1.244 pàg.

LÓPEZ FERNÁNDEZ, M.L. (1994). *Organografía Cormofítica de Espermatófitas*. Ed. EUNSA. Pamplona. 179 pàg.

LÓPEZ GONZÁLEZ, G. (2001). Los árboles y arbustos de la Península Ibérica e islas Baleares. Vol. 1- 2. Mundi Prensa. 1.727 pàg. Madrid.

MASALLES, R.M., J. CARRERAS, A. FARRÀS, J.M. NINOT & CAMARASA, J.M. (1988). *Plantes superiors* (Història Natural dels Països Catalans, 6). Enciclopèdia Catalana, S.A. Barcelona, 463 pàg.

RIVERA, D. & OBÓN, C. (1991).- *La guía INCAFO de las plantas útiles y venenosas de la Península Ibérica y Baleares*. Ed. INCAFO. Madrid.

STRASBURGER, E., F. NOLL, H. SCHENCK & SCHIMPER, A.F.W. (1988). *Tratado de Botánica* (actualitzat per D.V. Denffer, F. Ehrendorfer, A. Bresinsky & H. Ziegler). Ed. Omega. Barcelona, 1.098 pàg.