UAB
Universitat Autònoma de Barcelona

Botany

Code: 107526
ECTS Credits: 6

2024/2025

Degree	Type	Year
2500250 Biology	FB	1

Contact

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Teachers

Josep Padulles Cubino

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

No prerequisites are required.

The subject will be easier to follow with previous knowledge on evolution, reproductive biology, and morphological and functional diversity of plants and fungi. It will be also very useful to have a good base on geography on a global and Iberian scale and on geological periods.

Objectives and Contextualisation

Botany deals with the study of plant diversity in a broad sense and, with a synthetic focus, also addresses the diversity of fungi.

The student will be able to construct a phylogenetic scheme to address flora and fungal biodiversity. This work will be closely related to aspects of systematics and plant evolution, as well as to the study of techniques and knowledge that allow classification of living beings (morphology, anatomy, molecular markers, biogeographic aspects, etc.).

Also, emphasis will be given to the main biological (life cycles, reproduction, etc.), evolutionary (phylogenetic relationships, evolutionary trends, coevolution, etc.), ecological (limiting factors, habitats, adaptation, etc.) processes and human applications (industry, land management, etc.) of the main groups studied.

Botany will be complemented with the subject *Vegetation analysis and mapping*, and it is fundamental to attend optional subjects such as *Ecology, evolution and diversity of cryptogams*, *Biology and diversity of phanerogams* and *Applied botany*.

Learning Outcomes

1. CM13 (Competence) Act in accordance with the Sustainable Development Goals in the process of managing and conserving plant communities.
2. KM20 (Knowledge) Describe the development, growth and biological cycles of plants and fungi, as well as their diversity and evolution.
3. KM21 (Knowledge) Identify plant and fungal species, applying current techniques of classification of living beings.
4. SM17 (Skill) Obtain plant and fungal specimens and materials for subsequent laboratory analysis.
5. SM19 (Skill) Analyse the origin, evolution and diversity of plants and fungi.

Content

- Macroevolution and phylogeny of plants and fungi

Fundamental concepts to understand the origin and evolution of the main groups (phylogenetic lines) of fungi and photoautotrophic organisms. Importance will be given to endosymbiosis processes that originated the main phylogenetic lines and plant diversity at basal levels of the tree of life.

The bases for the interpretation of classification systems and taxon delimitation will be given under a fundamentally evolutionary perspective, as well as the macroevolutionary processes that have taken place.

- Characteristics, biodiversity and systematics of the main groups of plants and fungi

The student will see the biological characteristics (morphology, reproduction and ecology) and some examples of the main groups of: cyanobacteria, fungi, algae and especially land plants (bryophytes, pteridophytes, gymnosperms and angiosperms).

A criterion of phylogenetic organization will be followed according to the most recent, and also classic, classification proposals. Emphasis will be placed on shared derived characters (synapomorphies) and genealogical relationships.

- Functional characteristics

Following the phylogenetic framework, the different goals acquired throughout the evolutionary process by fungi and plant organisms will be highlighted, among others: origin of the chloroplast, origin of the embryo, acquisition of vascular tissue, origin and evolution of the seed and the pollen grain, and the evolution of the flower and the fruit.

Special mention will be made of coevolution and diversification processes. Other functional aspects will also be discussed, such as the importance of algae in marine and inland ecosystems, or the ecological role of fungi or fungal symbioses in terrestrial ecosystems.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Field trips	10	0.4	CM13, KM21, SM17, CM13
Laboratory practices	12	0.48	CM13, KM20, KM21, SM17, SM19, CM13
Seminars	4	0.16	CM13, KM20, KM21, SM19, CM13
Theoretical sessions	27	1.08	CM13, KM20, KM21, SM19, CM13
Type: Supervised			
Herbarium	50	2	KM21, SM17, KM21
Type: Autonomous			
Study	44	1.76	CM13, KM20, KM21, SM19, CM13

This subject presents a strong practical component closely related to theoretical contents. Therefore, students must be responsible for keeping up-to-date with the acquired knowledge both during theoretical sessions and in practices, including seminars.

- Directed activities

- Lectures or theory sessions:

The diversity, ecology and systematics of plants, fungi and other photoautotrophic groups will be presented. The phylogenetic groups will be organized according to an updated classification system. The teaching material corresponding to each theory topic will be available to students in Campus Virtual - Moodle.

- Seminars:

A part of the contents of this subject will be taught through two sessions of seminars. In them, a connection will be established between theory, practices and the herbarium work. Emphasis will be placed on developing skills for the identification of plants, the use of dichotomous identification keys, and the recognition of plants and their diagnostic characteristics. In addition, morphology and diversity of fruits will be treated in detail.

- Practices:

There will be two types of practical activities: laboratory and field practices.

- Laboratory practices:

They consist of six sessions of laboratory practices where the different groups of organisms treated in the theoretical classes will be presented. Students will have documentation, which include information on the observation methodologies of the plant material, the main structures to be identified, and a specific glossary. The students will have to fill in a specific report for each practical session. This material will be provided through *Campus Virtual-Moodle*.

- Field trips:

They consist of three sessions that will be held in the field, in accessible places. There will be an introduction to floristic diversity and to the general aspects of the ecology of plant communities. Documents with information on the environmental and landscape characteristics of some visited itineraries will be provided through *Campus Virtual-Moodle*.

- Supervised activities

- Course work: Herbarium

Students must prepare and present an herbarium of a given number of wild plants. The herbarium will consist of plants collected by the students and pressed, labelled, and identified with the scientific name.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Herbarium	20%	0	0	KM21, SM17
Practical exam	25%	1	0.04	CM13, KM20, KM21, SM17, SM19
Theoretical exams	55%	2	0.08	CM13, KM20, KM21, SM19

The assessment consists of a theoretical part and a practical part. The student will need to get a minimum score of 5 in each of the two parts to pass the subject.

I. Theoretical part: 55%

First partial written exam: 27.5%

Second partial written exam: 27.5%

It is necessary to obtain a mark equal to or greater than 5 in each one of the partial exams to be assessed of the subject. Students who have not passed the partial theoretical exam(s) may submit to a recovery exam for the part corresponding to partial exam not passed. For the calculation of the mean of the theoretical part, the score obtained in the recovery exam will replace the original score of that partial exam.

II. Practical part: 45%

Practical exam: 25%

Herbarium work: 20%

The practical exam will consist of the identification of fungi and plant organisms of the groups studied in laboratory practices and field practices, and in the recognition and description of morphological structures and functional aspects.

Students must prepare the herbarium following the teacher's instructions throughout the course, and deliver it to the end of the course on the date indicated.

It is necessary to obtain a mark equal to or greater than 4 in the practical exam and in the herbarium to be evaluated of the subject. There is the possibility to recover only the partiial exam.

Attendance to practices, both laboratory and field, is mandatory. The students will we graded as "Non-evaluable" when their absence exceeds 20% of the programmed sessions.

UNIQUE ASSESSMENT:

For students who have requested it in accordance with the regulations, the unique assessment of this subject consists of:

-A single synthesis test in which the contents of the entire theory program and seminars of the subject will be evaluated. The test will consist of test-type questions. The grade obtained in this synthesis test will account for 55% ofthe final grade of the subject and it will be necessary to obtain a grade equal to or higher than 5 to pass the subject. The single evaluation test will be done coinciding with the same date fixed in the calendar for the last theory test of the continuous evaluation (date of the second partial exam) and the same recovery system will be applied as for the continuous evaluation.

- The evaluation of the practical activities will follow the same process as the continuous evaluation. The grade obtained in the practice block will account for 45% of the final grade of the subject. The students who take the single evaluation will take the practical exam coinciding with the same date fixed in the calendar for the last theory test of the continuous evaluation (date of the second partial exam). The practical exam will have a weight of 25% of the final mark and will also consist of the identification of fungi and plant organisms of the groups studied in the laboratory practices and in the field trips, and in the recognition and description of morphological structures and functional aspects. The preparation of the herbarium will be done in groups and must be handed in on the same date that is established for the continuous evaluation or on the date fixed in the calendar for the last theory test of the continuous evaluation (date of the second partial exam), as agreed with the students during the course. The herbarium will have a weight of 20% in the final grade of the subject. As in the continuous evaluation, it is necessary to obtain a grade equal to or higher than 4 in the practical exam and in the herbarium in order to be evaluated for the subject. The average of these two grades must be equal to or higher than 5 to be evaluated for the subject. There is no recovery for either of these two assessment activities.

Attendance at practices, both in the laboratory and in the field, is mandatory. The students will be graded as "Non-evaluable" when their absence exceeds 20% of the scheduled sessions.

The student will be graded as "Non-evaluable" if the weighting of all conducted evaluation activities is less than 67% of the final score.

Bibliography

Theory:

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Izco, J. *et al.* 2004. Botánica. McGraw-Hill-Interamericana. Madrid.

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Practices:

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Font Quer, P. 2015. Iniciació a la Botànica, 3a ed. revisada i actualitzada per Vallès, J. i Vigo, J. Edicions de la Universitat de Barcelona. Barcelona.

Gerhardt, E. *et al*. 2000. Hongos de España y de Europa. Omega. Barcelona.

Llistosella, J. & Sánchez-Cuixart, A. 2004. L'herbari. Arbres, arbusts i lianes. Edicions de la Universitat de Barcelona. Barcelona.

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Llistosella, J. & Sánchez-Cuixart, A. 2015. Guia il·lustrada per a conèixer els arbres. Edicions de la Universitat de Barcelona. Barcelona.

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Llistosella, J. & Bernal, M. 2022. Manual pràctic de botànica. Morfologia de les plantes vasculars. Edicions de la Universitat de Barcelona. Barcelona.

López González, G. 2001. Los árboles y arbustos de la Península Ibérica e Islas Baleares. Tomos I y II. Ed. Mundi-Prensa. [Recurs electrònic disponible a la UAB]

Recasens, J. 2000. Botànica agrícola. Plantes útils i males herbes. Universitat de Lleida. [Recurs electrònic disponible a la UAB]

Wirth, V. *et al*. 2004. Guía de campo de líquenes, musgos y hepáticas. Omega. Barcelona.

Web sites:

Flora catalana.net. La flora del nostre entorn: http://www.floracatalana.net/

Herbari virtual del Mediterrani occidental: http://herbarivirtual.uib.es/cat-med/index.html

Tree of Life web project: http://tolweb.org/tree/

Software

There is no specific software in this course.

Language list

Name	Group	Language	Semester	Turn
(PCAM) Field practices	111	Catalan	first semester	morning-mixed
(PCAM) Field practices	112	Catalan	first semester	morning-mixed
(PCAM) Field practices	113	Catalan	first semester	morning-mixed
(PCAM) Field practices	114	Catalan	first semester	morning-mixed
(PCAM) Field practices	115	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	111	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	112	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	113	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	114	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	115	Catalan	first semester	morning-mixed
(SEM) Seminars	111	Catalan	first semester	morning-mixed
(SEM) Seminars	112	Catalan	first semester	morning-mixed
(TE) Theory	11	Catalan	first semester	afternoon