

Degree programme	Type	Course
Environmental Biology	OP	4

Contact lecturer

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Teaching staff

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Group languages

You can consult this information at the [end](#) of the document.

Prerequisites

It is desirable, and will help the follow-up of the course, that students are familiar with basic knowledge of botany, phylogeny and plant evolution.

Objectives

This course deals with basic aspects related to the biology and diversity of the Spermatophytes. Its general objective is that students are trained in the main theoretical aspects and in the applicable methods in research or management initiatives in the field of plant biodiversity. The specific objectives are the following:

- (1) To provide a scientific framework that integrates information from various scientific disciplines and allows the study of seed plants diversity.
- (2) To address the study of plant biodiversity from an evolutionary perspective.
- (3) To understand the main biological, evolutionary and ecological processes that determine seed plants diversity.
- (4) To gain knowledge about the differential characteristics, and the reproductive, biological, ecological and corological aspects, as well as human applications, of the main Mediterranean plant families.

Learning outcomes

1. Develop self-directed learning.
2. Focus on quality.
3. Recognise the characteristics that differentiate the principal groups of phanerogams and cryptogams.
4. Interpret the distribution and the interactions in the environment of plant species and their impact on

- plant diversity.
5. Interpret the evolutionary processes that have led to the diversity of cryptogams and phanerogams.
 6. Collect, determine and conserve specimens and collections of cryptogams and phanerogams.
 7. Interpret the origin and functioning of cell and tissue structures in the different groups of cryptogams and phanerogams.
 8. Interpret the causes and the functioning of adaptation to the environment on the part of cryptogams and phanerogams.
 9. Interpret and recognise the different stages in the biological cycles of phanerogams and cryptogams.
 10. Introduce changes in the methods and processes of the field of knowledge to provide innovative responses to the needs and demands of society.
 11. Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
 12. Actuar en l'àmbit de coneixement propi avaluant les desigualtats per raó de sexe/gènere.

Contents

Topic 1: Introduction to Spermatophytes: origin, evolution, characteristics and main groups.

Topic 2: Evolution and main mechanisms of speciation. Hybridization and introgression: implications.

Topic 3: Apomixis: Problematic groups of plants with apomictic reproduction mechanisms.

Topic 4: Biological strategies of the Spermatophytes. Analysis of the different vital forms and examples of the variation of the spectrum of biological forms.

Topic 5: Reproductive strategies of spermatophytes. Pollination. Autogamy and allogamy: implications. Mechanisms to avoid auto pollination.

Topic 6: Reproductive strategies of the Spermatophytes: Analysis of the different dispersion mechanisms and examples.

Topic 7: Gymnosperms: characteristics, evolutionary trends and study of different groups.

Topic 8: Angiosperms: characteristics, evolutionary trends and study of the different groups.

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Laboratory work	12	0.48	6, 8, 9, 11
Work preparation	60	2.4	1, 2, 3, 4, 6, 8, 9, 10, 11, 12
Study	30	1.2	1, 2, 3, 5, 7, 8, 9, 11, 12
Seminars	6	0.24	2, 5, 8, 10, 11, 12
Lectures	18	0.72	2, 3, 4, 5, 7, 8, 9, 10, 11, 12
Field practices	18	0.72	1, 2, 3, 4, 6, 8, 9, 10, 11, 12

The subject is based on the combination of the following teaching typologies:

(1) lectures or theory classes in a whole group. The theoretical concepts and methods of the discipline are explained and the most complex and important points of the syllabus are highlighted and addressed. They will serve as a basis for students to complement it with bibliographical information and non-face-to-face study. The theoretical sessions are 50 minutes long and will be carried out using audiovisual material prepared by the teaching staff and that the students will have available on the Virtual Campus.

(2) seminars. Resources and tools specific to the discipline are discussed in a practical and participatory way, some of which are necessary for the development of the assessable work, and specific problems or cases of current study are presented.

(3) laboratory practices. Students will have fresh plant material and the appropriate equipment, tools and bibliography to learn to interpret the vegetative and reproductive structures of angiosperms and to identify the species studied with the guidance and support of the teaching staff.

(4) field trips. With the guidance and support of the teaching staff, various areas of special interest will be visited to learn about the plant diversity representative of ecosystems in the Iberian northeast, including numerous endemic species and those of biogeographic interest. The sites visited will allow for the analysis and discussion in the field of various aspects covered in theoretical classes, seminars and practicals related to the vital strategies of spermatophytes, their morphological and functional diversity, adaptations to the environment, and their threats and conservation status.

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

Continuous assessment activities

Title	Weight	Hours	ECTS	Learning outcomes
Practical exam	30%	3	0.12	1, 2, 3, 4, 6, 8, 9, 10, 11, 12
Theoretical exam	40%	3	0.12	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12
Autonomous field work	30%	0	0	1, 2, 3, 4, 6, 8, 9, 10, 11, 12

The assessment consists of a theory block and a practical block. A minimum grade of 4 must be obtained in each of the two blocks to be assessed for the subject.

Theory block:

Theoretical exams: a set of essay questions related to the theoretical syllabus and seminars. There will be two eliminatory partial exams, each of which will have a weight of 20% of the final grade for the subject. It is necessary to obtain a grade equal to or greater than 4 in each of the two partial exams to be assessed for the subject.

Each of the two parts of the theoretical block can be recovered in a recovery exam that will be similar to the partial exam and will have the same weight in the final grade.

Practical block:

Practical exam: a test that will consist of the identification and description of plants. Laboratory and field practices will help acquire the skills and knowledge necessary to successfully pass this test, which will have a weight of 30% of the final grade of the subject.

Autonomous field work: consists of the preparation of a floristic catalog of an area of free choice. To carry out this work, students will have the guidance of the teaching staff during the seminars and laboratory practices.

In this work, the use of Artificial Intelligence (AI) technologies is allowed exclusively in the bibliographic or information search or the correction of texts, but not in the analysis and discussion of results. The use of automatic plant identification tools is also allowed. In all cases and aspects in which an AI tool has been used, the student must clearly identify which parts of the text have been generated or corrected with this technology, which species have been automatically identified, specify the tools used in each case, and include a critical

reflection on how these have influenced the process and the final result of the activity. The lack of transparency in the use of AI in this assessable activity will be considered a lack of academic honesty and will lead to a partial or total penalty in the grade of the activity, or greater sanctions in serious cases. This work will have a weight of 30% of the final grade of the subject.

It is necessary to obtain a grade equal to or greater than 4 in the practical exam and in the work to be able to be assessed for the subject.

The practical block is not recoverable.

A date will be set in advance so that students can review the grades obtained.

Students will obtain the grade of \"Not assessable\" when the assessment activities carried out have a weighting of less than 67% in the final grade.

SINGLE ASSESSMENT:

For students who have requested it in accordance with the regulations, the single 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 exam will consist of essay questions. The grade obtained in this synthesis test will represent 40% of the final grade of the subject and it is necessary to obtain a grade equal to or greater than 4 to be assessed for the subject. The single assessment test will be held on the same date set in the calendar for the last theory test of the continuous assessment (date of the second partial exam) and the same recovery system will be applied as for the continuous assessment.

The evaluation of the practical activities will follow the same process as the continuous assessment. The grade obtained in the practical block will represent 60% of the final grade for the subject. Students who take the single assessment will take the practical exam coinciding with the same date set in the calendar for the last theory test of the continuous assessment (date of the second partial exam). The practical exam will have a weight of 30% of the final grade and will also consist of the identification and description of plants. The autonomous field work must be submitted on the same date established for the continuous assessment or on the date set in the calendar for the last theory test of the continuous assessment (date of the second partial exam), as agreed with the students during the course. The work will have a weight of 30% in the final grade for the subject and will follow the same rules as in the case of the continuous assessment. As in continuous assessment, it is necessary to obtain a grade equal to or greater than 4 in the practical exam and the assignment in order to be assessed for the subject. There is no retake of either of these two assessment activities.

A date will be set in advance so that students can review the grades obtained.

Students will obtain the grade of \"Not assessable\" when the assessment activities carried out have a weighting of less than 67% in the final grade.

Any irregularity committed during an assessment activity (academic misconduct, plagiarism, or improper use of AI, unless such use is expressly authorized in the course syllabus) that may lead to a significant alteration of the grade will result in that activity being graded as 0. If the course syllabus stipulates that obtaining a minimum mark in this assessment is an essential requirement to pass the course, or if multiple irregularities occur in the assessment activities of the same course, the final grade for the course will be 0. Furthermore, disciplinary proceedings may be initiated against any student who incurs any of these irregularities.

Bibliography

TEXT BOOKS AND DICTIONARIES OF BOTANY:

- Aguilera i Palasí, Antoni & Pucho, Felisa. (2004). Diccionari de botànica. (1st ed.). Publicacions de la Universitat de València (PUV). [Available](#) online
- Aguilera i Palasí, Antoni & Pucho, Felisa. (2004). Diccionari de botànica. Universitat de València. [Available](#) in the library
- Bresinsky, Andreas [i altres]. (2013). Strasburger's plant sciences : including prokaryotes and fungi. Springer. [Available](#) online
- Christenhusz, Maarten J. M. & Chase, Mark W. & Fay, Michael F. (2017). Plants of the world: an illustrated encyclopedia of vascular plants. The University of Chicago Press / Kew Publishing Royal Botanic Gardens Kew. [Available](#) in the library
- Folch, Ramon. (1985-2013). Història natural dels Països Catalans. Enciclopèdia Catalana. [Available](#) in the library. In particular, volume 6: Masalles, R.M.; J. Carreras; A. Farras; J.M. Ninot & J.M. Camarasa (1988). Plantes superiors. Història Natural dels Països Catalans. Vol. 6. Enciclopèdia Catalana. Barcelona.
- Font i Quer, Pius. (2009). Diccionario de botánica. (4ª ed.) Península. [Available](#) in the library
- Simpson, Michael G. (2020). Plant Systematics. (3rd ed.) Academic Press. [Available](#) online
- Simpson, Michael G. (2019). Plant systematics. (3rd ed.) Academic Press. [Available](#) in the library
- Willis, K. J. & McElwain, J. C. (2014). The Evolution of plants. (2nd ed.) Oxford University Press. [Available](#) in the library
- Zardoya San Sebastián, Rafael & Vargas, Pablo. (2012). El Árbol de la vida : sistemática y evolución de los seres vivos. sn. [Available](#) in the library

FLORAS, IDENTIFICATION KEYS AND REGIONAL RED BOOKS:

- Bolòs, Oriol de. (2005). Flora manual dels Països Catalans. (3ª ed. Rev. ampl.) Pòrtic. [Available](#) in the library
- Bolòs, Oriol de & Vigo, Josep. (1984-2001). Flora dels Països Catalans. Barcino. [Available](#) in the library
- Castroviejo, Santiago [i altres]. (1986-). Flora iberica : plantas vasculares de la Península Ibérica e Islas Baleares. Real Jardín Botánico CSIC. [Available](#) online and in the library
- López González, Ginés A. (2006). Los Árboles y arbustos de la Península Ibérica e Islas Baleares : (especies silvestres y las principales cultivadas). (2ª ed. corr.) Mundi-Prensa. [Available](#) in the library
- López González, Ginés A. (2006). Los árboles y arbustos de la Península Ibérica e Islas Baleares. (2ª ed.) Mundi-Prensa. [Available](#) online
- Sáez, Llorenç & Blanché, Cèsar & Aymerich, Pere. (2010). Llibre vermell de les plantes vasculars endèmiques i amenaçades de Catalunya. Argania. [Available](#) in the library

INTERNET RESOURCES:

Regional floristic works and checklist:

- Flora iberica: <http://www.rjb.csic.es/floraiberica/>

Tots els volums disponibles: <http://bibdigital.rjb.csic.es/spa/Volumenes.php?Libro=473>

- Sáez, Llorenç & Aymerich, Pere. (2021). An Annotated checklist of the vascular plants of Catalonia: northeastern Iberian Peninsula. (1st ed.) Llorenç Sáez & Pere Aymerich. [Available](#) online

Digital herbaria and plant images:

- La flora del nostre entorn: www.floracatalana.cat
- Herbari virtual de la Mediterrània Occidental: <http://herbarivirtual.uib.es/cas-med/>
- Herbari virtual de la Universitat de Barcelona: <http://www.bib.ub.edu/cedocbiv/herbari-virtual/>

Information on plant biogeography, taxonomy and conservation:

- Font i Castell, Xavier & Quadrada, R. & Cáceres Ainsa, Miquel de. Banc de dades de biodiversitat de Catalunya. Universitat de Barcelona; Generalitat de Catalunya Departament de Medi Ambient. [Available](#) online
- Angiosperm Phylogeny Website: <http://www.mobot.org/MOBOT/research/APweb/>
- IUCN red list of threatened species. [Available](#) online

Software

There is no specific software in this course.

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this [link](#). To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	24	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	241	Catalan	second semester	afternoon
(SEM) Seminars	241	Catalan	second semester	morning-mixed
(PCAM) Field practices	241	Catalan	second semester	morning-mixed
(PCAMs) Suport a les pràctiques de camp dirigides	241	Catalan	second semester	morning-mixed