

Degree	Type	Year
Biology	OT	4

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Teaching groups languages

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

Prerequisites

To enrol in the course, students must have completed and passed the first-year Botany course. Moreover, students are expected to have an interest in biodiversity-related topics and a strong commitment to contribute to conservation.

Objectives and Contextualisation

The general objective of the course is to understand the immense social, environmental, cultural, and economic value of plants, algae, and fungi, while highlighting the wide range of applications that botany has at the societal level.

Through case studies, laboratory work, and field trips, the course will demonstrate how botanical knowledge is applied in global efforts to address major socio-ecological challenges facing humanity, such as the climate emergency, biodiversity loss, and food sovereignty.

The specific objectives of this course are:

1. To train students in methodologies used to apply botanical knowledge in practice, in order to address some of the social and ecological challenges facing humanity.

2.To provide a global overview of our current scientific knowledge on plants, algae, and fungi, and to review the different regulatory frameworks for their conservation and sustainable use.

3.To offer a scientific framework for the study and research of the main uses and applications of plants, algae, and fungi in fields such as health, agriculture, palynology, and the conservation and restoration of species and ecosystems.

Competences

- Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
- Analyse and interpret the development, growth and biological cycles of living beings.
- Be able to analyse and synthesise
- Develop a sensibility towards environmental issues.
- Identify and classify living organisms.
- Make changes to methods and processes in the area of knowledge in order to provide innovative responses to society's needs and demands.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
- Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.
- Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
- Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
- Take sex- or gender-based inequalities into consideration when operating within one's own area of knowledge.

Learning Outcomes

1. Analyse a situation and identify its points for improvement.
2. Analyse and interpret the development, growth and biological cycles of plants.
3. Be able to analyse and synthesise.
4. Critically analyse the principles, values and procedures that govern the exercise of the profession.
5. Develop a sensibility towards environmental issues.
6. Identify and classify the plants.
7. Propose new methods or well-founded alternative solutions.
8. Propose viable projects and actions to boost social, economic and environmental benefits.
9. Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
10. Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
11. Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
12. Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.
13. Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.

14. Take sex- or gender-based inequalities into consideration when operating within one's own area of knowledge.

Content

The content is structured into five thematic blocks: one transversal introductory block and four blocks focused on different practical applications of botany:

Block 1. Introduction to Applied Botany

Coordinator: Álvaro Fernández-Llamazares

This block will provide an overview of applied botany and its different variants. Examples of concrete cases where botanical knowledge has been mobilized to contribute to the conservation of plants, algae, and fungi will be presented, as well as their sustainable uses and applications. A general review of the global state of knowledge on plants, algae, and fungi will also be made, presenting the rates of discovery of new species, their main threats, and the methodological tools used for their study. Finally, some of the professional opportunities available in the field of applied botany will be outlined.

Theoretical classes: 2 hours

Field trip: Visit to the Botanical Garden of Barcelona and the Institut Botànic de Barcelona (5 hours)

A guided visit will be conducted by the technical and scientific staff of the Institut Botànic de Barcelona (IBB). This visit will include the collections of the Botanical Garden, the IBB Herbarium (the most important herbarium in Catalonia), the Salvador Cabinet (one of the few naturalist collections from the Enlightenment that have survived to the present day), and the germplasm bank (a genetic material collection with over 3,000 records). Additionally, some of the projects, research lines, and plant prospecting campaigns led by the main botanical research center in Catalonia will be presented.

Block 2. Ethnobotany

Coordinator: Álvaro Fernández-Llamazares

This block will present the theoretical and methodological foundations of ethnobotany, the science that studies the uses and properties of plants, algae, and fungi, as well as their social, cultural, and spiritual importance in different societies worldwide. Case studies on traditional knowledge of plants, algae, and fungi in Catalonia will be presented, along with the use of sacred plants in various Indigenous societies. The theory of biocultural diversity will be introduced, explaining how plants, algae, and fungi are deeply embedded in humanity's cultural fabric. The concept of "plant blindness" (also known as "Plant Awareness Disparity") will also be introduced, which refers to the inability to perceive, value, or interact with the plants in our environment and to recognize their fundamental contributions to human well-being. Additionally, the origins of agriculture and the centers of domestication and dispersal of the main cultivated plants will be addressed. The dynamic relationships between humans and plants will be highlighted, not only from a knowledge perspective but also from an identity and psychological viewpoint. Several case studies on wild edible plants and the recovery of local cultivated plant varieties will be presented.

Theoretical classes: 8 hours

Laboratory practice: Gastronomy of wild edible plants (2 hours)

This laboratory practice will be conducted by Col·lectiu Eixarcolant, a non-profit organization that promotes the recovery - and adaptation to current realities - of the uses of edible wild species and traditional agricultural varieties as a tool to foster more sustainable, healthy, and just agro-food models. This practice will deepen the knowledge of wild edible plants, with special emphasis on their preparation for gastronomic purposes.

Seminar: Applied ethnobotany and cultivated diversity (1 hour)

This seminar, given by Dr. Laura Calvet-Mir, an environmental scientist and ethnobotanist (Institut Metròpoli), will review various case studies aimed at recovering traditional cultivated varieties, for example through seed exchange networks, plant exchange fairs, and scientific assessments of the status of local crops in the homegardens of the Catalan Pyrenees.

Block 4. Habitat Assessment and Restoration

Coordinator: Ferran Pauné

This block will present the fundamental elements that allow the assessment of environmental quality and state changes of a site or ecosystem based on the interpretation of flora and vegetation. The concepts of indicator species and species assemblages in a plant community will be addressed. Various techniques for sampling flora and vegetation will be presented, along with how to extract different indicators depending on the design. Emphasis will be placed on ecological processes linked to the indicators, especially species interactions and disturbance processes. Case studies that have helped to understand the ecological processes underlying habitat changes will be presented, as well as guidance on managing conservation and restoration of plant landscapes, and informing policies on fire prevention and climate change mitigation.

Theoretical classes: 5 hours

Field trip: Visit to the Congost River Valley (5 hours)

This visit will provide a broad view of different practical cases of projects and protocols for evaluating the natural environment based on indicator flora, as well as visits to several environmental restoration interventions. The trip will be led by Aprèn Serveis Ambientals (a company dedicated to the study, management, and dissemination of environmental matters), and will explore the use of plants for environmental improvement of the area and bioengineering techniques. Various natural sites in the Congost River Valley (e.g., El Figaró and La Garriga) will be visited, where the company has directed environmental improvement work over recent years.

Seminar: Plant communities as a tool to assess habitat conservation status (1 hour)

In this seminar, Andreu Salvat, botanist and expert in fluvial space management (Aprèn Serveis Ambientals), will present various protocols and practical cases he has worked on throughout his professional career, taking advantage of the bioindicator potential of plant communities to assess the conservation status of pastures, riverbanks, riparian forests, and mature forests.

Seminar: Marine algae: ecological functions and applications in the marine environment (1 hour)

This seminar, led by biologist and naturalist specialized in marine taxonomy Xavier Salvador (Institut de Ciències del Mar), will address the ecological role of marine algae, both phytoplankton and multicellular forms, as primary producers in the marine environment. Concepts such as their function as bioindicators, their role in nutrient recycling and oxygen production, and their structural importance in certain ecosystems will be explained. Several ecological restoration projects in the marine environment, especially involving rhodophytes and phaeophytes, will also be presented.

Block 4. Conservation of Plants, Algae and Fungi

Coordinator: Llorenç Saez

This block will provide an overview of all current conservation efforts aimed at reversing the loss of diversity of plants, algae, and fungi worldwide. The main regulations and laws regarding the harvesting of plants, algae, and fungi will be reviewed, along with ethical considerations concerning the exploitation of protected endemic plants harvested for medicinal use, as well as the exploitation of forests by mushroom gatherers. Finally, the fundamental legal protection frameworks for threatened and protected plant species will be presented, and the different mechanisms for classifying species according to their risk of extinction will be reviewed.

Theoretical classes: 8 hours

Seminar: Practical cases in plant conservation (2 hours)

In this seminar, led by Moisès Guardiola (UAB), various case studies on plant species conservation will be presented, along with an overview of freelance work as a professional pathway in the field of applied botany.

Computer lab practice: Biodiversity databases (3 hours)

In this computer session, the different existing biodiversity databases (both in Catalonia and internationally) will be introduced, along with their practical application for estimating species' threat levels according to IUCN criteria, using the RAMAS Red List software.

Block 5. Applications of Plants, Algae and Fungi in Human Health

Coordinator: Álvaro Fernández-Llamazares

This block will review the applications of plants, algae, and fungi in the field of human health. It will provide a general overview of plant bioactive compounds (toxins, poisons, biocides, psychoactives) and their pharmacological applications. An introduction to palynology will be offered, with special emphasis on aerobiology and its contribution to the study of respiratory allergies and the phenology of anemophilous plants and fungi. Finally, urban green planning will be discussed, highlighting its importance for public health and the renaturalization of cities in an increasingly urbanized world.

Theoretical classes: 6 hours

Laboratory practice: Visit to the Palynological Analysis Laboratory at UAB (1 hour)

The visit will be guided by technical staff managing the facility and will showcase ongoing research related to pollen and spore analysis. The operation of laboratory equipment will be explained, including the "Palinoteca" (a reference collection for identifying different types of pollen), pollen and spore traps, and spore-pollen protein samplers used for aerobiological sampling, as well as devices used to obtain pollen and spores from materials such as honey (for quality control), terrestrial and archaeological sediments (for studies on climate history, vegetation, and human-nature interactions).

Laboratory practice: Applied palynology (3 hours)

This practical session will focus on observing pollen and spores under the microscope, with special emphasis on identifying those most relevant as triggers of respiratory allergies, those of significant landscape interest, and those important for honey/nectar production. It will demonstrate in practical terms how recognizing and measuring the diversity and concentrations of pollens and spores can be applied in the pharmaceutical and biotechnological industries working on allergies and air quality.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Field trips	10	0.4	4, 2, 1, 6, 7, 8, 5, 3
Laboratory practices	6	0.24	2, 6, 8, 5, 3
Practices with computer	3	0.12	4, 8, 12, 9, 10, 5, 3
Seminars	5	0.2	14, 4, 12, 10, 5, 3
Theory classes	29	1.16	14, 4, 2, 1, 6, 7, 13, 12, 11, 9, 10, 5, 3

Study	87	3.48	5, 3
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The methodology of this course is based on a combination of the following activities:

(1) Theoretical classes where the concepts and methods of applied botany are explained. The theoretical sessions highlight and address the fundamental points of each thematic block. Afterwards, students can complement the conceptual map they have created with bibliographic information through their independent work. The theoretical sessions last 50 minutes and will use audiovisual materials prepared by the teaching staff, which will be made available to students on the Virtual Campus in PDF format.

(2) Seminars where specific case studies or methodologies related to each thematic block are analyzed. Several of these seminars will be delivered by external professionals who apply their knowledge in various branches of botany and can offer unique and novel perspectives on the topics covered in the theoretical classes.

(3) Field trips. Visits will be made to institutions related to different professional fields within applied botany: the Institut Botànic de Barcelona (IBB), the Botanical Garden of Barcelona, and the company Aprèn Serveis Ambientals.

(4) Computer lab practice. A computer-based practical session will be devoted to introduce the main biodiversity databases and to learn how to estimate the threat level of a species applying the IUCN criteria.

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
Exam of laboratory practices	20%	6	0.24	2, 6, 8, 5, 3
Exam of theory 1st partial	40%	2	0.08	14, 4, 2, 1, 6, 7, 13, 12, 11, 9, 10, 5, 3
Exam of theory 2nd partial	40%	2	0.08	14, 4, 2, 6, 13, 12, 11, 9, 10, 5, 3

The course will be evaluated based on the grades obtained in two eliminatory midterm exams (with the possibility of retake), as well as participation in seminars and practical sessions, as detailed below

1) 1ST PARTIAL EXAM OF THEORY. Assesses the relevant theoretical content through an exam. A minimum grade of 5 is required to pass the evaluated material. This exam accounts for 40% of the final course grade.

2) 2ND PARTIAL EXAM OF THEORY. Assesses theoretical content and the computer-based practical session through an exam. A minimum grade of 5 is required to pass the evaluated material. This exam accounts for 40% of the final course grade.

3) PRACTICES. Evaluation will be based on an exam related to the laboratory practices. The practices account for 20% of the final course grade. A minimum grade of 5 is required to pass the course. There is no compensation or retake for this component.

4) RETAKE EXAM. Only students who failed one or both theoretical midterms will be required to take it. It will follow the same structure and weight as the midterm exams (40% per block). A minimum grade of 5 is required in each block to pass the course. No compensation is allowed.

SINGLE EVALUATION

Single evaluation will consist of a comprehensive exam covering the entire content of the course (theoretical, practical, and seminar-based). The grade obtained in this synthesis exam will account for 100% of the final course grade. This exam will take place on the same date and time as the second midterm exam. If not passed, it may be retaken on the date scheduled for the theoretical retake exam in the course calendar.

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Block 3. Habitat Assessment and Restoration

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Block 4. Conservation of Plants, Algae and Fungi

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Bloc 5. Applications of Plants, Algae and Fungi in Human Health

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Software

RAMAS Red List Professional, <https://www.ramas.com/red-list-pro>

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PCAM) Field practices	141	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	141	Catalan	first semester	morning-mixed
(SEM) Seminars	141	Catalan	first semester	morning-mixed
(TE) Theory	14	Catalan	first semester	morning-mixed