

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

There are no official prerequisites, but it is advisable for the student to review the contents related to the subject of Botany.

Objectives

Throughout this course, students must acquire the knowledge that gives them a vision as fully as possible of the knowledge bases and the diversity of cryptogamous plants, from a functional, systematic and phylogenetic perspective. It should also allow it to place each group in an ecological context, in relation to the number of species, habitat and way of life, position within the ecosystems as well as their importance in relation to their interest in the activities of management of the natural environment .

The specific training objectives are:

- Introduce to the students the main structuring concepts of the study of cryptogames
- Understand the systematics and phylogenetic relationships between the main groups of organisms as a result of evolutionary and adaptive processes.
- Know the main levels of organization and architectural patterns of organisms.
- Give some knowledge about morphological features, biological cycles, ecological importance and highlight the biotechnological importance of the main groups of organisms.

Learning outcomes

1. Develop self-directed learning.
2. Focus on quality.
3. Recognise the basic principles of botany that must be conveyed in the field of secondary education.
4. Recognise the characteristics that differentiate the principal groups of phanerogams and cryptogams.
5. Interpret the distribution and the interactions in the environment of plant species and their impact on plant diversity.
6. Interpret the evolutionary processes that have led to the diversity of cryptogams and phanerogams.
7. Collect, determine and conserve specimens and collections of cryptogams and phanerogams.
8. Interpret the origin and functioning of cell and tissue structures in the different groups of cryptogams and phanerogams.
9. Interpret the causes and the functioning of adaptation to the environment on the part of cryptogams and phanerogams.
10. Interpret and recognise the different stages in the biological cycles of phanerogams and cryptogams.
11. Actuar en l'àmbit de coneixement propi avaluant les desigualtats per raó de sexe/gènere.

Contents

Content

The main groups of the Cryptogamic Botany and types of classifications.

BRYOPHYTES: Diversity, main evolutionary lines and common and distinctive characteristics of the main groups.

BRYOPHYTES: Liverworts, Mosses and Hornworts. Vegetative and reproductive characteristics. Phylogeny and diversity. Examples of some of the species present in the Iberian Peninsula more characteristics.

BRYOPHYTES: Adaptations, biogeographical and conservationist aspects.

FERNS: Diversity, main evolutionary lines and common and distinctive characteristics of the main groups and mechanisms of speciation.

FERNS: Morphological diversity, phylogeny and ecology. Characteristics of the main groups: Lycophytes and Monilophytes. Examples of some of the species present in the Iberian Peninsula more characteristics. Diversity in the Iberian Peninsula and biogeographic patterns. ALGAE. Taxonomic characteristics Evolution of the chloroplast. The phylogeny of algae. Pigments, reserve substances and other cellular characteristics.

ECOLOGY OF ALGAE. Biotic and abiotic ecological factors that condition the distribution of algae. Zonation The algae as indicators of the evolution of climate and landscape. Outcrops, blooms and red tides. Conditioning factors. Algae toxins.

BIOLOGICAL ASPECTS. Symbiosis. Zooxantelas, zoocianelas and cyanocyanals. Symbiosis with vascular plants. Lichens Natural resources of human exploitation. Applications.

CYANOBACTERIA. Cell structure. Stromatolites. Reproduction. Morphological diversity. Movement. Ecology. Applications. GLAUCOPHYTES. Ancestral characters of the chloroplast and phylogeny. Mobility. Ecology.

RODOPHYTES, CHLOROPHYTES. Cell structure. Morphological diversity. Reproductive structures. Vital cycles. Distribution and economic interest. Characteristics of the different representative groups and genres. Ecological aspects Evolutionary interest of chlorophytes and relation to CLORARACNIOPHYTES
EUGLENIDS, DINOFLAGELLATES, HETEROCONTOPHYTES and CRIPTOPHYTES Cell structure. Ecology. Study of the most representative genera.

PRIMNESIOPHYTES. Cell structure. Climatic indicators.

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Preparation of field trips and reading of texts	9	0.36	8, 9, 10
Lectures	24	0.96	8, 9, 10
Preparation of seminars conducted by students on a specific topic	20	0.8	8, 9, 10
Field practices	10	0.4	7
Lab sessions	10	0.4	7, 8, 9, 10
Study	60	2.4	8, 9, 10
Seminars	8	0.32	8, 9

Teaching methodology and training activities:

The subject consists of two types of teaching, lectures and seminars, with an integrated program so that the student must relate throughout the course content and activities scheduled to achieve the competencies indicated.

- Participatory lectures: The student must acquire the scientific-technical knowledge of this subject by attending these classes and complementing them with the personal study of the topics explained. The teaching of each subject will be based on a theoretical presentation with student participation.

- Lab sessions: one of the main objectives will be the knowledge of the different groups of cryptogams, their characteristics and their ecology. The students must learn the correct way in terms of handling the different taxa and their conservation.

- Seminars: will be based on exhibitions that students will have prepared and will deal with issues related to the subject and will allow the students to reflect and personally work on the topics discussed. As a complement to the seminars, issues related to the subject that may be discussed by students and teachers in the virtual campus forum will be considered.

- Field trips: two field trips will be made to study the main studied taxa of bryophyte and pteridophyte algae "in situ". Equally important will be able to establish the main ecological parameters of the groups that are seen in the field.

Use of AI: model 2, restricted use

Model 2 - Restricted Use: For this subject, the use of Artificial Intelligence (AI) technologies is permitted exclusively in support tasks, such as bibliographic or documentation searches in the work of creating Powerpoint presentations. The student must clearly identify which parts have been generated with this technology, specify the tools used 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 may lead to a partial or total penalty in the grade of the activity, or greater sanctions in serious cases.

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
Evaluation of the presentations in the seminars	20%	2	0.08	3, 5, 6, 7, 8, 9, 10, 11
Practical exam	20%	2	0.08	1, 2, 4, 6, 7
Second mid-term assignment	30%	2.5	0.1	8, 9, 10
First mid-term theoretical exam	30%	2.5	0.1	8, 9, 10

The evaluation of the subject will be individual and continuous through the following tests:

- Two theoretical eliminatory exams (each one is 30% of the overall mark). Two partial tests eliminatory matter when the grade obtained by the student is equal to or greater than 5. There will be a recovery test where you can recover the partial no superats. Per participate in the recovery, the student must have been previously evaluated in a set of activities the weight of which equals a minimum of two thirds of the total grade of the subject or module. Therefore, the students will obtain the \"Not Evaluable\" qualification when the evaluation activities carried out have a weight lower than 67% in the final grade \"
- Evaluation of the seminars and autonomous activities (20% of the global mark). The oral presentation of a topic within the scope of the seminars will be evaluated (content, synthesis capacity, rigor in the expression, quality of the documentary sources and adaptation to the established time) as well as the participation and attendance to seminars and field trips. On the other hand, there will also be an evaluation on the knowledge obtained in the field trips.
- Practical exam (20% of the overall score).
- Unique evaluation: Students who take the Unique evaluation must complete the laboratory practicals (PLAB) in presential sessions as well as the Field courses (PCAM). Attendance will also be compulsory for the seminars (SEM), these with their own evaluation, with weight on the final mark as in the continuous evaluation. The unique evaluation consists of a single synthesis test on the contents of the whole theory programme plus the contents of the PLAB and PCAM. The mark obtained in the synthesis test is 80% of the final mark of the subject, the mark obtained in the seminars is the remaining 20%. The single assessment test will be held on the same date set in the calendar for the last continuous assessment test and the same recovery system will be applied as for the continuous evaluation.

Any irregularity in an assessment act (academic fraud, plagiarism or improper use of AI, unless this use is expressly authorized in the teaching guide), which may lead to a significant variation in the grade, means that this act will be graded with a 0. In the event that the teaching guide provides that to pass the subject it is an

essential requirement to have obtained a minimum grade in this assessment act or that several irregularities occur in the assessment acts of the same subject, the final grade for this subject is 0. Apart from this, a disciplinary process may be initiated against the student who incurs any of these irregularities.

Bibliography

Bibliography

BOLD, H.C. & M.J. WYNNE. 1987. Introduction to the Algae, ed. 2. Prentice-Hall, Englewood Cliffs, New Jersey.

BOLD, H.C. et al. 1989. Morfología de las plantas y los hongos. Omega. Barcelona. CASTROVIEJO et al. 1986 (eds.) Flora Iberica [Part corresponent a Pteridophyta]. Real Jardín Botánico-CSIC. Madrid.

LEE, Robert Edward. 2008. Phycology. Cambridge: CambridgeUniversity Press. (4th edition). 560 pp

LLIMONA, X. et al. 1985. Plantes inferiors. Història Natural dels Països Catalans. Vol. 4. Enciclopèdia Catalana. Barcelona. MARGULIS, L., CORLISS, J.O., MELKONIAN, M, CHAPMAN, D.J. 1990. Handbook of Protocista. Ed. Jones & Barlett Publishers

MARGULIS, L., CHAPMAN, M. J. 2009. Kingdoms & domains: an illustrated guide to the phyla of life on earth. Ed. Elsevier, Academic Press. MAUSETH, J. D. 1998. Botany. An Introduction to Plant Biology, 2/e. Multimedia enhanced edition. Ed. Jones & Bartlett Publ.

SÁEZ, L. 2025 Les falgueres de catalunya. Brau Edicions. 192 pp.

INTERNET

<http://tolweb.org/tree>

Websites for phytoplankton identification:

<http://algaekey.com/index.php>

<http://www.algalweb.net/search1.htm>

<http://cfb.unh.edu/phycokey/phycokey.htm>

<http://protist.i.hosei.ac.jp/>

<http://researcharchive.calacademy.org/research/diatoms/genera/>

<http://arts.monash.edu.au/ges/research/cpp/diatoms/generic.php>

<http://westerndiatoms.colorado.edu/taxa>

Software

Online databases (free access) on ecological, chorological data of the studied species

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
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(TE) Theory	24	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	241	Catalan	first semester	afternoon
(SEM) Seminars	241	Catalan	first semester	morning-mixed
(PCAM) Field practices	241	Catalan	first semester	morning-mixed
(PCAMs) Suport a les pràctiques de camp dirigides	241	Catalan	first semester	morning-mixed