

Biology and Diversity in Phanerogams

Code: 100803
ECTS Credits: 6

Degree	Type	Year	Semester
2500250 Biology	OT	4	2

Contact

Name: Merce Galbany Casals
Email: merce.galbany@uab.cat

Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Teachers

Llorenç Saez Goñalons

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 and Contextualisation

This course deals with basic aspects related to the biology and diversity of the Spermatophytes. Its general objective is to train the students in the main theoretical aspects and in the applicable methods in research or management initiatives in the field of the inventory of the 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 the diversity of seed plants.
- (2) To addressing the study of plant biodiversity from an evolutionary perspective.
- (3) To understand the main biological, evolutionary and ecological processes that influence the diversity of seed plants.
- (4) To provide knowledge about the differential characteristics, reproductive, biological, ecological and corological aspects, as well as human applications, of the main families of studied plants.

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.

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.

Content

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.

Methodology

The methodology used is based on 1) the information directly provided by the teacher and 2) the work of the student both in the laboratory and field sessions. The course is based on the combination of lectures (theory classes), seminars and laboratory work.

(1) lectures or theory (in whole group) where the concepts and methods of the discipline are explained. Lectures stand out and address the complicated and important points of the subject. The student should complement the information given in class with bibliographic information and autonomous work. The lectures are 50 minutes long and will be presented using material prepared by the teacher, and that the student will have available on the Virtual Campus.

(2) seminars where problems are analyzed or specific cases of study and participatory debates are made about the significance and limitations of the concepts and methods explained in theory. These seminars allow to deal with topics that are usually of special interest (due to their controversy or current affairs) but which are outside a general agenda of the subject, as they refer to a very specific topic and would break the main thread of the course.

(3) laboratory work. Laboratory practices will be carried out. Tools and bibliography will be provided to the students so that they can identify the species studied.

(4) field excursions. There will be field practices in which the students will visit areas with floristic diversity representative of the ecosystems of the northeastern Iberian Peninsula and that allow to work, analyze and criticize some of the concepts and methods treated in both lectures and seminars. Students will also see practical cases of conservation of species and habitats on the ground.

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.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Elaboration of works	60	2.4	4, 2, 1, 6, 7, 8, 13, 12, 11, 9, 10, 5, 3
Field practices	18	0.72	4, 2, 6, 5
Laboratory work	12	0.48	6, 5
Lectures	18	0.72	2, 1, 8, 13, 12, 11, 9, 10, 5, 3
Seminars	6	0.24	4, 1, 7, 12, 10
Type: Autonomous			
Study	30	1.2	2, 6, 13, 3

Assessment

The assessment consists of a block of theory and a block of practices. The student will need to get a minimum score of 4 in each of the two blocks to pass the subject.

Block of theory:

Theoretical exams: set of questions (brief and very specific in general) related to the theoretical classes. There will be two eliminatory and non-recoverable partial exams, each of which will have a weight of 20% of the final mark of the subject. It is necessary to obtain a mark equal to or greater than 4 in each one of the partial exams to be assessed of the subject.

Each of the two parts of the block of theory can be reassessed through a reassessment exam that will be equivalent to the partial exam and will have the same weight in the final score.

To be eligible for the retake process, the student should have been previously evaluated in a set of activities equaling at least two thirds of the final score of the course. Thus, the student will be graded as "No Avaluable" if the weighing of all conducted evaluation activities is less than 67% of the final score.

Block of practices:

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

Field work: the student will carry out a work that consists in the elaboration of a floristic catalogue of an area of free choice. The student will have the orientation on the part of the professors during the sessions of laboratory work to make progress on this work, that will have a weight of a 30% of the final mark of the subject.

It is necessary to obtain a mark equal to or greater than 4 in the practical exam and the floristic catalogue to be assessed of the subject. The block of practices cannot be reassessed.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Autonomous field work	30%	0	0	4, 2, 1, 6, 7, 8, 13, 12, 11, 9, 10, 5, 3
Practical exam	30%	3	0.12	4, 2, 6, 5
Theoretical exam	40%	3	0.12	4, 2, 1, 6, 7, 8, 13, 12, 11, 9, 10, 5, 3

Bibliography

TEXT BOOKS AND DICTIONARIES OF BOTANY:

AGUILELLA, A. & F. PUCHE (2004). Diccionari de Botànica. Universitat de València. València.

BRESINSKY, A. *et al.* 2013. Strasburger's Plant Sciences (Including Prokaryotes and Fungi). Springer. Berlin. [Electronic resource available at UAB]

CHRISTENHUSZ, M.J.M.; M.F. FAY & M.W. CHASE. 2017. Plants of the world: an illustrated encyclopedia of vascular plant families. Royal Botanic Gardens, Kew.

FONT i QUER, P. (1963). Diccionario de Botánica. Labor. Barcelona.

IZCO, J.; E. BARRENO; M. BRUGUÉS; M. COSTA; J. DEvesa; F. FERNÁNDEZ; T. GALLARDO; X. LLIMONA; C. PRADA; S. TALAVERA & B. VALDÉS (2004). Botánica. Ed. 2. Mc Graw-Hill Interamericana. Madrid.

MASALLES, R.M.; J. CARRERAS; A. FARRAS; J.M. NINOT & J.M. CAMARASA (1988). Plantas superiores. Història Natural dels Països Catalans. Vol. 6. Enciclopèdia Catalana. Barcelona.

SIMPSON, M.G. (2010). Plant Systematics, 2nd Ed. Burlington, MA. Academic Press.

VARGAS, P. & R. ZARDOYA (Eds.) (2012). El árbol de la vida. Sistemática y evolución de los seres vivos. Museo Nac. Ciencias Naturales.

WILLIS, K.J. & J.C. McELWAIN (2014). The Evolution of Plants. 2nd edition. Oxford University Press. Oxford.

FLORAS, IDENTIFICATION KEYS AND REGIONAL RED BOOKS:

BOLÒS, O. & J. VIGO (1984-2001). Flora dels Països Catalans. 4 vols. Ed. Barcino. Barcelona.

BOLÒS, O.; J. VIGO; R.M. MASALLES & J.M. NINOT (2005). Flora manual dels Països Catalans. Ed. Pòrtic. 3a ed. Barcelona.

CASTROVIEJO, S. et al. (Eds.) (1986-2015). Flora iberica. Plantas vasculares de la Península Ibérica e Islas Baleares. CSIC. Madrid.

CASTROVIEJO, S. et al. (Eds.) (2001). Claves de Flora iberica. I. Real Jardín Botánico-CSIC. Madrid.

LÓPEZ, G. (2001). Los árboles y arbustos de la Península Ibérica. 2 vols. Ediciones Mundi-Prensa. Madrid.
[Electronic resource available at UAB]

SÁEZ, L., P. AYMERICH & C. BLANCHÉ (2010). Llibre Vermell de les plantes vasculars endèmiques i amenaçades de Catalunya. Argania Editio. Barcelona.

INTERNET RESOURCES:

Floristic works:

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

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/>

Global Biodiversity Information Facility in Spain: <http://www.gbif.es>

Herbari virtual de la Universitat de Barcelona: <http://www.bib.ub.edu/cedocbiv/herbari-virtual/>

Images de la Flore de France: http://ifdf.free.fr/index_fr.htm

Vascular Plant image gallery: <http://www.csd.tamu.edu/FLORA/gallery.htm>

Information on plant biogeography, taxonomy and conservation:

Banc de dades de Biodiversitat de Catalunya: <http://biodiver.bio.ub.es/biocat/homepage.html>

Projecte Anthos Espanya: <http://www.programanthos.org>

Angiosperm Phylogeny Website: <http://www.mobot.org/MOBOT/research/APweb/>

Endangered species: <http://www.iucnredlist.org/>

Software

There is no specific software in this course.