

**Animal and Plant Biology**

Code: 100946  
ECTS Credits: 3

Degree	Type	Year	Semester
2500253 Biotechnology	OB	1	2

**Contact**

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**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**

Concepcion de Linares Fernandez

**Prerequisites**

There are no official prerequisites, but it is advisable for the student to review the contents related to zoology and botany of the Biology subject of the baccalaureate.

**Objectives and Contextualisation**

Throughout this course, the student must acquire the knowledge that gives him a vision as complete as possible of the zoological and botanical bases and of the diversity of animals, plants and fungi from an anatomical, 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 applied sciences.

The specific training objectives are:

- Introduce to the student the main structuring concepts of the science of Zoology and Botany.
- 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.

**Skills**

- Describe the molecular, cellular and physiological bases of the organisation, functioning and integration of living organisms in the framework of their application to biotechnological processes.
- Read specialised texts both in English and ones own language.

- Reason in a critical manner
- Search for and manage information from various sources.
- Think in an integrated manner and approach problems from different perspectives.

## Learning outcomes

1. Develop a critical approach to anthropic impacts on the biosphere.
2. Identify the principal groups of living beings studied by botany.
3. Identify the principal groups of living beings studied by zoology.
4. Read specialised texts both in English and ones own language.
5. Reason in a critical manner
6. Search for and manage information from various sources.
7. Think in an integrated manner and approach problems from different perspectives.

## Content

**Origin and phylogeny.** Origin and classification of living beings. Groups of organisms studied within Animal and Plant Biology.

**Classification systems.** Taxonomy. Systematics. Taxonomic units. Classification. Species concept. Nomenclature rules.

**Reproduction and cycles in the plant world.** Asexual reproduction. Spores. Sexual reproduction, gametes, gametangi and types of gammy.

**Algae.** The main groups of algae. The endosymbiotic origin, its ecology and its morphology. The origin of the chloroplast. Phytoplankton, primary production and blooms (algal toxins).

**Heteroconts.** General characteristics, criteria of classification and diversity.

**The rhodophyta.** General characteristics, criteria of classification and diversity. Uses and applications.

**The fungi.** Origin and phylogenetic situation of fungi. Main groups. Biotechnological importance of fungi. The symbiosis of fungi and its importance in terrestrial ecosystems.

**Green plants.** The lineage of the higher plants. Chlorophytes and their evolution towards green plants. Bryophytes, ferns, reproduction and ecology. The colonization of terrestrial plants, mechanisms and adaptations. Operation of the corm.

**Flowering plants.** Origin, reproductive biology and reproductive cycle. Groups of flowering plants. Groups of economic interest and groups that make up the landscape.

**Gymnosperms.** General characteristics. Description, ecology, geographical distribution and uses of the species of greatest interest.

**Angiosperms.** General characteristics. Diversity, description, ecology, geographical distribution and uses of the species of greatest interest.

**Generalities of animals.** Zoology as a science. Animal concept. Animal diversity. Basic principles of Zoology. Sorting of animals. Levels of animal organization. Archetype and general plans of animal organization. Types of symmetries.

**Animal reproduction and development.** Types of asexual and sexual reproduction. Parthenogenesis. Adaptive meaning of the different reproductive modes. Animal development. Ontogeny. Segmentation. Gastrulation. Formation of mesoderm. Organogenesis. Direct and indirect development. Larves and Metamorphosis.

**Sponges.** General characters. Cell organization. Structural types. Representative groups. Functional adaptations to the aquatic environment.

**Cnidaria.** General characters. Cellular elements. Representative groups. Biological cycles.

**Bilaterals. Protostomes. Lophotrochozoa. Plathelminths.** Basic characters. Adaptations of different groups to parasitism. Biological cycles of species with parasitic importance.

**Annelids.** Basic characters of the annelids. Main groups and adaptations to the different habitats.

**Molluscs.** Basic characters of the group. Importance of the shell and its evolution. Main groups and their adaptations to the different habitats.

**Protostomes. Ecdysozoa. Arthropods.** General characters. Structure and importance of the cuticle. Tagmosis. General characteristics of the different arthropod groups and their environmental adaptations.

**Deuterostomes. Chordates.** Exclusive chordate traits. Comparative characters of Urocordates and Cephalocordates. Biology of the two groups.

**Vertebrate Diversity: Agnatha and Gnathostomata.** Compared general characters. Diversity and environmental adaptations. Diversity of Vertebrates: Amphibians, Reptiles, Birds and Mammals. Compared general characters. Diversity and environmental adaptations.

## Methodology

The methodology used in this subject to achieve the learning process is based on making the student work the information that is put to his reach. The function of the teacher is to give the information or to indicate where the student can get it and help him so that the learning process can be carried out effectively. To achieve this goal, the subject is based on the following activities:

Master classes:

With these classes, the student acquires the basic scientific and technical knowledge of the subject that must be complemented with the personal study of the topics explained.

## Activities

Title	Hours	ECTS	Learning outcomes
<b>Type: Directed</b>			
Master Classes	24	0.96	1, 2, 3
<b>Type: Supervised</b>			
Supervised activities carried out in the framework of the virtual campus	6	0.24	6, 1, 2, 3, 4, 7, 5
<b>Type: Autonomous</b>			
Documentary research and participation in the virtual campus discussion forum	4	0.16	6, 4, 7, 5
Study	30	1.2	6, 1, 2, 3, 4, 7, 5
Text reading	5	0.2	6, 4, 5

## Evaluation

The evaluation of this subject is carried out throughout the course, and it consists of the following evaluating activities:

### Evaluation tests

Partial exams:

In these examinations the student's knowledge on the subject, as well as his capacity for analysis and synthesis, and critical reasoning, will be examined individually.

There will be 2 eliminatory partial exams of matter.

Final exam:

Students who do not pass (minimum mark of 5) one of the two partial exams must submit to the final exam. If in the final exam one of the notes is less than 4 the student will not pass the subject. Likewise, the students that wish to improve the mark of one or both parts will be able to do it attending to the final exam. Applying for the final exam implies that the previously obtained mark will be lost.

Not evaluable:

It will be considered that a student will obtain the Non-Evaluable qualification when the number of assessment activities carried out is less than 50% of those programmed for the subject

## Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Final exam	100	3	0.12	1, 2, 3
Partial exam of Animal Biology	50	1.5	0.06	6, 1, 3, 4, 5
Partial exam of Plant Biology	50	1.5	0.06	6, 1, 2, 4, 7, 5

## Bibliography

ALTABA, C. et al. 1991. Invertebrats no artròpodes. Història Natural dels Països Catalans. Vol. 8. Enciclopèdia Catalana. Barcelona.

ARMENGOL, J. et al. 1986. Artròpodes (I). Història Natural dels Països Catalans. Vol. 9. Enciclopèdia Catalana. Barcelona.

BARNES 2009. Zoología de los Invertebrados. Ed. MacGraw-Hill. Interamericana. Setena edició.

BLAS, M. et al. 1987. Artròpodes (II). Història Natural dels Països Catalans. Vol. 10. Enciclopèdia Catalana. Barcelona.

BOLD, H.C. et al. 1989. Morfología de las plantas y los hongos. Omega. Barcelona.

BRUSCA R.C. i BRUSCA G.J. 2005. Invertebrados. Ed. MacGraw-Hill. Interamericana. Segunda edición.

FERRER, X et al. Ocells. Història Natural dels Països Catalans. Vol. 12. Enciclopèdia Catalana. Barcelona.

FOLCH, R. et al. 1984. Vegetació. Història Natural dels Països Catalans. Vol. 7. Enciclopèdia Catalana. Barcelona.

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

HICKMAN, C.P. et al. 2014. Integrated Principles of Zoology. Ed. Interamericana. Quinzena edició.

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

LLIMONA, X. (ed.) 1985. Plantes inferiors. Història Natural dels Països Catalans. Vol. 4. Enciclopèdia Catalana. Barcelona.

LLIMONA, X. (ed.) 1991. Fongs i líquens. Història Natural dels Països Catalans. Vol. 5. Enciclopèdia Catalana. Barcelona.

MASALLES, R.M. et al. (eds.) 1988. Plantes superiors. Història Natural dels Països Catalans. Vol. 6. Enciclopèdia Catalana. Barcelona.

MAUSETH, J. D. 1998. Botany. An Introduction to Plant Biology, 2/e. Multimedia enhanced edition. Jones & Bartlett Publ. Boston, Toronto, London, Singapur.

SOSTOA, A. et al. Peixos. Història Natural dels Països Catalans. Vol. 11. Enciclopèdia Catalana. Barcelona.

STRASBURGER, E. et al. 2004. Tratado de Botànica. Omega. Barcelona.

VIVES, J. et al. Amfibis, rèptils i mamífers. Història Natural dels Països Catalans. Vol. 13. Enciclopèdia Catalana. Barcelona.

**Web links:**

- Aula Virtual de l'Autònoma Interactiva: <https://cv2008.uab.cat>
- Animal Diversity Web: <http://animaldiversity.ummz.umich.edu/>
- Adena/World Wildlife Found: <http://www.wwf.es/>
- Biodidac: <http://biodidac.bio.uottawa.ca>
- Tree of life web project: <http://tolweb.org/tree/phylogeny.html>
- Understanding evolution: [http://evolution.berkeley.edu/evolibrary/article/evo\\_01](http://evolution.berkeley.edu/evolibrary/article/evo_01)
- Comissió Internacional de Nomenclatura Zoològica: <http://www.iczn.org/>
- Curs de Botànica de la Universitat d'Extremadura: <http://www.unex.es/botanica/LHB>
- Museu Nacional de Ciències Naturals de Madrid (CSIC): <http://www.mncn.csic.es/>
- Natural History Museum, Londres: <http://www.nhm.ac.uk/>