

Animal and Plant Biology

Code: 101956
ECTS Credits: 9

Degree	Type	Year	Semester
2500890 Genetics	FB	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

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Concepcion de Linares Fernandez

Prerequisites

It is recommended to review the concepts related to Zoology and Botany of the Biology course studied at high school as well as the general concepts to Genetic, Evolution and Cellular Biology shown during this course

Objectives and Contextualisation

The course has three blocks: Botany, Plant Physiology and Zoology. An introduction to the study of the morphological and biological diversity of the several groups of plants and animals will be made under an evolutionary perspective. In the corresponding part of the Plant Physiology the student will be introduced to the basic knowledge of the biology and functioning of plants as well as their regulation by several factors. In general, throughout this course, the student must acquire a vision as complete as possible of the zoological and botanical bases and of the diversity of animals, plants from an anatomical, functional, systematic and phylogenetic perspective.

Objectives:

Botany:

- 1- Concept of Plants (broadly speaking) and the fields of study of Botany.
- 2- To study of biodiversity and plant systematics from an evolutionary perspective and discuss classification methods.
- 3- To know the main biological processes (life cycles, reproduction, nutritional strategies, dispersion), evolutionary (speciation, evolutionary tendencies, co-evolution) and ecological (habitats, adaptations to the environment) that affect plant biodiversity.
- 4- To give some knowledge about the applications of the main plants groups.

Plant Physiology:

- 1- To integrate the knowledge of vegetables at different organizational levels and within the entire organism.
- 2- To introduce the basic vital functions of plants.
- 3- To know the regulation by internal and external factors.

Zoology:

- 1- To introduce to the student the main concepts that delimits the different levels of animal organization, as well as the main architectonic patterns of the same.
- 2- In the same way with the reproduction and development processes that condition them.
- 3- Obtain an overview of the main animal groups, based on their morphological diversity.

This objective will be delimited in three blocks:

- 1- Main groups of non-arthropod invertebrates
- 2- Main groups of Arthropods
- 3- Main groups of Chords

Skills

- Apply scientific method to problem solving.
- Be able to analyse and synthesise.
- Be able to communicate effectively, orally and in writing.
- Describe the diversity of living beings and interpret it evolutionally.
- Develop self-directed learning.
- Reason critically.
- Recognise and structurally and functionally describe the different levels of biological organisation, from macromolecules to ecosystems.
- Use and manage bibliographic information or computer or Internet resources in the field of study, in ones own languages and in English.

Learning outcomes

1. Apply scientific method to problem solving.
2. Be able to analyse and synthesise.
3. Be able to communicate effectively, orally and in writing.
4. Describe the morphology and bionomics of the main animal taxa.
5. Develop self-directed learning.
6. Globally explain the functional mechanisms of plants.
7. Identify the differential morphological characteristics of each taxonomic group of plants.
8. Integrate the functional processes of plants, on different organisational levels, to the whole plant organism.
9. Interpret animal and plant diversity, their origin and their evolution.
10. Interpret the biological cycles of animal groups.
11. Reason critically.
12. Recognise and classify plants and the main types of vegetation.
13. Use and manage bibliographic information or computer or Internet resources in the field of study, in ones own languages and in English.

Content

I: Botany

1. Introduction.
2. Classification systems.
3. Reproduction and Biological Cycles.
4. Cyanobacteria.
5. Euglenoids and Dinoflagellates.

6. Heteroconts: Diatoms and brown algae.
7. The Rhodophyta.
8. The Chlorophyta and the Streptophyta.
9. The Briophyta.
10. The Vascular Plants.
11. Spermatophyta I. Origen, evolution and morphology of the corn.
12. Spermatophyta II. Origin and evolution of the flower.
13. Spermatophyta III. Gymnosperms Diversity.
14. Spermatophyta IV. Angiosperms Diversity.
15. Fungal phylogeny I. Origin and phylogenetic. Zigomicota and Ascomicota.
16. Fungi phylogeny II. Basidiomycota.
17. Fungal phylogeny III. Amebooides fungi (Mixomicets) and Pseudofongs (Heteroconts: Oomicets).
18. Symbiosis. Lichen and Mycorrhizas.

II: Plant Physiology

1. The vegetal life: relation nutrition and form.
2. Water needs: concept of water potential, osmotic relationships and growth.
3. Absorption and transport of water.
4. Mineral needs: mineral nutrition of the plant.
5. Absorption and transport of nutrients.
6. Plants and light: photosynthetic pigments; Transformation of energy.
7. Carbon Reduction Assimilation: Metabolism C3.
8. Photorespiration.
9. Metabolism C4 and CAM.
10. Reduction assimilation of nitrogen and sulfur.
11. Regulation of growth and development by internal factors: Phytohormones and genetic regulation.
12. Regulation by external factors: Sensory and regulation systems of flowering.
13. Dormition. Germination of seeds.
14. Fruit formation and maturation.
15. Senescence and abscission.
16. Introduction to plant genetic improvement.

III: Zoology

1. Introduction. General concepts
2. Main animal groups.
3. General morphology of the main groups of non-arthropod invertebrates.
4. General morphology of the main Arthropod groups.
5. General morphology of the main groups of Chordates.

Methodology

The methodology used to achieve the learning process is based on making the student work the information that is available. The function of the teacher is to give the information or indicate where you can achieve it, by guiding and tutoring it so that the learning process can be carried out effectively. To achieve this goal, the subject is based on the following activities, through the combination of: master classes, seminars, personal study and individual and team work.

Master classes:

With these classes the student acquires the basic scientific-technical knowledge of the subject that must be complemented with the personal study of the topics explained. The theoretical sessions stand out and address the complicated and important points of each didactic unit. Subsequently, the student from the conceptual map will be able to complement it with bibliographic information from his non-contact work. Theoretical sessions are 50 minutes long.

Seminars:

The mission of the seminars is to promote the capacity for analysis and synthesis, critical reasoning and the capacity to solve problems. In seminars, various activities can be carried out, such as analysis and discussion of cases and problems, public presentation of works, commentary of videos, resolution of questions related to the topics covered, etc.

Tutorials

The tutorials will be carried out in person at the teacher's office (hours to be arranged). Tutorials should be used to clarify concepts, establish the knowledge acquired and facilitate study by students. They can also be used to solve doubts that students have about the preparation of self-learning.

Activities

Title	Hours	ECTS	Learning outcomes
Type: Directed			
Classes of theory	54	2.16	1, 4, 5, 6, 7, 8, 10, 9, 12, 2
Seminars and case resolution	15	0.6	1, 6, 8, 9, 11, 3, 2
Type: Supervised			
Carry out balanced learning exercises	2	0.08	1, 5, 6, 7, 8, 9, 11, 12, 2, 13
Tutories in group and individual	4	0.16	5, 6, 8, 9, 11, 3, 2
Type: Autonomous			
Bibliographic Research	6	0.24	4, 6, 8, 9, 2, 13
Case resolution	7	0.28	1, 4, 6, 7, 10, 9, 11, 12, 3, 2, 13
Drafting of Works	10	0.4	4, 6, 7, 8, 10, 9, 12, 2, 13
Reading of texts	6	0.24	5, 13
Study	60	2.4	5, 6, 8, 11, 2

Evaluation

The three thematic modules, Botany, Plant Physiology and Zoology, have an equitable weight of 33% each in the final grade of the subject. Only the 3 modules will be considered when each one of the notes in each module exceeds 5 points out of 10. The note of each module is the result of theory and seminars / problems.

To pass the subject, an average minimum grade of 5.0 must be obtained.

The evaluation of this subject is carried out throughout the course, following the following criteria:

Written test: short / medium / type test questions, where the students' knowledge in the subject will be evaluated individually, as well as their ability to analyze, synthesize, and critically reason. Students who do not pass some of the written tests may retrieve them to the final exam of recovery. 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 or module

Seminars / Problems: The quality of the preparation and presentation of public works or exhibitions will be assessed as well as the answers to the questions and problems proposed.

Students who have not passed one of the three modules (grade less than 5 out of 10) will not pass the subject. In spite of this, it will not be necessary for the student to carry out the teaching activities or the evaluations of that module passed after the second enrollment. Repeaters will only have to be evaluated from the module (s) that have not been exceeded.

This exemption will be maintained for a period of three additional license plates.

The obtaining of the Honor Matriculation will be applied from a note equal to or greater than 9.0. The number of MH will depend on the number of enrollments of the current course.

Improvement of note

Students who want to improve their final grade of all or any of the modules can do so by presenting themselves to the final exam. In this case, it is understood that the student waives the previous qualifications of the modules that are examined and his final grade is calculated from the new final exam's grade. It is not possible to improve the note through work or other types of activities.

Definition of non-evaluable

It will be considered that a student will obtain the qualification of NOT AVALUABLE if the following assumption is given:

The weightin of all conducted evaluation activities is less than 67% of the final score

It will be described as non-evaluable to all those students who have not submitted a written and / or a seminary in writing and have not carried out any of the assessment tests planned. It is understood, therefore, that if the student does at least one of the exams or presents at least one of the works contemplated in the ordinary assessment, he will have to carry out the complete evaluation of the subject.

Special cases

If for justified reasons (illness, death of a first-degree relative or accident, etc.) and provide the official documentation corresponding to the Degree Coordinator, they will be entitled to take the test in question on another date. The Degree Coordinator will ensure the specification of this with the teacher of the subject affected. However, if for the same justified reasons, the student could not perform the evaluation tests in the assigned hours, they can do them in special schedules to agree with the teaching staff.

Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Botany: Individual or group test throughout the course (seminars)	8%	2	0.08	1, 5, 6, 8, 11, 2, 13
Botany: Partial and final tests (individual assessment)	25%	2	0.08	1, 4, 5, 7, 10, 9, 11, 12, 2, 13
Plant Physiology: Individual or group test throughout the course (seminars)	8%	2	0.08	1, 5, 7, 8, 9, 11, 12, 2, 13
Plant Physiology: Partial and final tests (individual assessment)	25%	18	0.72	1, 5, 6, 8, 11, 3, 2, 13
Zoology: Individual or group test throughout the course (seminars)	8%	18	0.72	1, 5, 7, 8, 9, 11, 12, 3, 2, 13
Zoology: Partial and final tests (individual assessment)	25%	19	0.76	1, 4, 10, 9, 11, 3, 2, 13

Bibliography

Botany

- Izco, J. et al. 2004. Botánica. Ed. 2. Mc Graw-Hill Interamericana. Madrid.
- Narbors, M. W., 2005. Introducción a la Botánica. Pearson, Madrid.
- Raven, P.H., Evert, R.F. & Eichhorn, S.E. 1991-1992. Biología de las Plantas. Vols. 1 i 2. Reverté. Barcelona.
- Strassburger, E. et al., 2004. Tratado de Botànica. 9ª edició. Omega, Barcelona.
- AAVV., 1984-1988. Història Natural dels Països Catalans. Vols. 4-6. Fundació - Enciclopèdia Catalana, Barcelona.
- Lee, R.E. 2008. Phycology. Fourth edition. Cambridge University Press, New York.

Plant Physiology

- Barceló, J. et al., 2005. Fisiología Vegetal. Piràmide, Madrid.
- Taiz, L. i Zeiger, E., 2006. Plant Physiology. Sinauer, Sunderland.

Zoology

- AAVV., 1984-1988. Història Natural dels Països Catalans. Vols. 8-14. Fundació Enciclopèdia Catalana, Barcelona.
- Grassé, P.P., 1982. Manual de Zoología. I i II. Invertebrados. Toray-Masson.
- Hickman, C.P. et al., 2008. Principios integrales de zoología. MacGraw-Hill. Interamericana.