



COURSE DESCRIPTION

In this subject, the students will acquire a general and integrated knowledge on living organisms from the morphological, biological, functional, evolutionary and ecological perspectives. At the end of the course, they will have a broad knowledge of the tree of life with special attention to plants and animals. The course also offers an introduction to the diversity and evolutionary systematics of living organisms.

- **Degree:** Biochemistry
- **ECTS:** 3
- **Year, semester:** 1st year, 2nd semester
- **Subject type:** required
- **Instructor:** Ana Villarroya, Department of Environmental Biology
- **Language:** English
- **Room, Schedule:** room to be determined. Sessions on Mondays 10:00-11:00 and Fridays 08.00-09.00

COMPETENCES

Specific competences

- CE7: Understand the differences between the main living organism groups, from microorganisms to higher organisms.

General and basic competencies

- CG3: To develop team-working capacities, to be able to select and to choose the appropriate methodologies and distribution of functions. To listen and to speak with positive and constructive interventions.
- CB1: To demonstrate knowledge and understanding in a particular field of study whose starting point is the general secondary education and includes aspects in the frontiers of knowledge, with the support of advanced textbooks.
- CB2: To be able to apply the obtained knowledge to the work in a professional manner and to show competencies have been acquired by means of the development and defense of ideas and problem resolution within their study area.
- CB4: To be able to communicate information, ideas and answer questions to specialist and non-specialist audiences.

SYLLABUS

Lectures (2h each)

- Introduction
 - Presentation
 - Life: origin, characteristics, organization, diversity
- Fundamentals of Biology
 - Biological nomenclature, taxonomy and systematics
 - Plant morphology and reproduction
 - Animal embryony development and archtypes



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- Biological Diversity
 - Fungi, Algae, Bryophytes (mosses) and Pteridophytes (ferns)
 - Spermatophytes: Gymnosperms (conifers) and Angiosperms (flowering plants)
 - Primitive animals
 - Invertebrates
 - Vertebrates
- Fundamentals of Ecology
 - Populations and Communities
 - Biogeography

Seminars (2h each)

(NOTE: the content of seminars might suffer slight changes)

- Plant diversity seminar
- Animal diversity seminar
- Integrative ecology: exploring plant-animal relationships

EDUCATIONAL ACTIVITIES

Lectures (22 hours)

Lectures will cover the syllabus and constitute the matter for the final exam. Attendance is not a requirement, but it is highly recommended.

Seminars (6 hours)

Practical sessions in which we will study *in situ* (using live material) the main characteristics of plants and animals and how to apply keys and knowledge to differentiate between them.

GRADING

There will be a final exam that will account for 90% of the total grade. The remaining 10% can be achieved by carrying out an assignment that will be described in class.

SECOND CALL (JUNE)

The exam in June will account for 90% of the total grade. The remaining 10% will correspond to the assignments carried out during the semester, and cannot be retaken in June.

TUTORING

By appointment only (avillarroya@unav.es)

BIBLIOGRAPHY AND RESOURCES

Recommended bibliography

Hickman et al. Integrated principles of Zoology. [Localízalo en la Biblioteca](#)



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Brusca, Brusca. Invertebrates. [Find it in the library](#)

Kardong. Vertebrates: comparative anatomy, function, evolution. [Localízalo en la Biblioteca](#)

Raven, Evert, Eichhorn. Biology of Plants. [Find it in the library](#)

Bresinsky et al. Strasburger's Plant Sciences. [Find it in the library](#)

van der Maarel, E. 2005. Vegetation Ecology. Wiley-Blackwell. 408 pp. [Find it in the library](#).
[Find it in the Library](#) [electronic source]

Related readings

Novo, Pereda, Sánchez-Cañizares. 2017. Naturaleza creativa . RIALP (spanish) [Localízalo en la Biblioteca](#)

Resources

The Plant List (2013). Version 1.1. <http://www.theplantlist.org/>

Tree of Life: <http://tolweb.org/tree/>

Open Tree of Life, interactive version of the tree of life: <http://opentreeoflife.org/>

Flora Iberica. Real Jardín Botánico de Madrid. CSIC: <http://www.floraiberica.es/index.php>

Watson, L. & Dallwitz, M.J. The Families of Flowering Plants: <http://delta-intkey.com/angio/>

Kean University, Union, NJ - BIO 2500 Principles of Botany: <http://samson.kean.edu/~breid/Botany/botlab14.html> <http://samson.kean.edu/~breid/Botany/botlab15.html>

Papers

Folse III HJ, Roughgarden J. 2010. What is an individual organism? A multilevel selection perspective. *The Quarterly Review of Biology* 85(4): 447-472. Accessible at: <https://www.journals.uchicago.edu/toc/qrb/2010/85/4>