Universitat Autònoma de Barcelona

2017/2018

Animal Biology

Code: 100991
ECTS Credits: 6

Degree	Type	Year	Semester
2500502 Microbiology	FB	1	1

Contact

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Use of languages

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

Other comments on languages

The lesson of Zoology are taught in Spanish, and the lesson of Animal Physiology are taught in Catalan

Teachers

Octavi Martí Sistac

Maria Camino Fierro Castro

Prerequisites

It is recommended to review the subjects of animal diversity (Zoology) and general concepts of genetics, evolution and cell biology studied in high school. It is also recommended to review the lessons studied in high school, about the structure (Anatomy) and the functioning (Physiology) of animal living things, particularly humans.

Objectives and Contextualisation

The course complements the introduction to the study of the morphological and anatomical diversity of the different groups of animals with a description of the function of the major physiological systems of animals, particularly humans. Both approaches complement the systematic and phylogenetic perspectives with the anatomical and functional of the course. By the end of this course student will be able to:

1. Situate each animal group in an eco-physiological context, valuing it in relation to the number of species, habitat and way of life, position within the ecosystems and importance in relation to their interest in the applied sciences and economics.

2. Understand the organization and biological bases of the main physiological systems, understood as highly interrelated, regulated and integrated entities.

Goals:

(1) To introduce to the student the main structuring concepts of the science of Zoology, with the aim to:

(I) understand the systematics and phylogenetic relationships among the major animal groups as a result of evolutionary and adaptive processes.

(II) know the main levels of organization of animals and their architectural patterns.

(2) To know the main groups of animals according to:

(I) its morphological characteristics,

(II) biological cycles,

(III) ecological importance, and

(IV) interactions with man.

(3) To achieve the basic knowledge of animal physiology, including:

(I) to know the organization and the anatomical and functional basis of animal physiological systems, with special attention to Humans.

(II) to identify the role and importance of major regulatory or control systems.

(III) to know the main biophysical, cellular, molecular and biochemical bases of the physiological systems to understand their function.

(IV) to understand the different physiological systems as highly interrelated and integrated entities.

(V) to understand the physiology of animal organisms as a basis for the development of studies and microbiological applications.

Content

MODULE I: Fundamentals of Zoology

- **Definition of Zoology.** The concept and characteristics of an Animal. Current situation of Animals in the World of living organisms. Concepts of species. Specific qualitative and quantitative variability. Reproductive barriers. The process of speciation: modes and causes. Biodiversity. Concept and notions of Zoogeography. Zoogeographic zones. Cosmopolitan and endemic species.
- **Basic Principles of Zoology.** Anatomy and Morphology. Concept of Anatomy. Morphological study. Concept of Homology and Homoplasia. Ordering the Animal World: Phylogeny. Systematics. Taxonomy: concept of taxon. Nomenclature: rules of animal nomenclature. Current phylogenetic view of Animals. The architectural pattern of Animals: Structural levels of organization. Archetype and plans of Animal organization. Concept and types of symmetry.
- **Animal reproduction.** Reproduction and sexuality. Modes of asexual and sexual reproduction. Parthenogenesis. Adaptive meaning of different reproductive patterns.
- **Animal development.** Embryonic development. Ontogeny. Segmentation. Gastrulation. Formation of the mesoderm. Coelom: importance of the appearance of the coelom. Organogenesis. Postembryonic development. Direct and indirect development. Metamorphosis. Life cycles.

MODULE II: zoological diversity

- **Porifera.** Cellular organization. Structural types. Representative groups. Evolutionary organization of groups. Functional adaptations to the aquatic environment.
- **Diploblastic metazoans.** Cnidarians. General characters. Cellular elements. Representative groups. Biological cycles.
- **The Triploblastic level.** Lophotrochozoan Protostomes. Platyhelminthes. Basic characters. Adaptations of the different groups to parasitism. Life cycles of parasiticspecies.
- **Annelids**. Basic characters of Annelids. Main groups and adaptations to different habitats. Importance and utilization of annelids by man.

- **Molluscs**. Basic characters of the group. Importance of the shell and their evolution. Main groups and adaptations to different habitats.
- **Ecdysozoan Protostomes**. Nematodes. Basic characters. Adaptations to different ways of life. Most representative life cycles.
- **Arthropoda**. General characters. Structure and importance of the cuticle. Basic elements of a segment. Tagmosis. General characteristics of the different groups of Arthropods and their environmental adaptations.
- **Hexapoda (Insects).** Basic characters. Importance of the group. Main groups. Insects and Man.
- **Deuterostomes. Echinoderms**. General organization of the group and adaptive diversification.
- **Chordates**. Exclusive characters of the Chordates. Compared characters of Urochordata and Cephalochordata. Biology of the two groups.
- **Diversity of Vertebrates I**. Agnatha and Gnathostomata. General characters compared. Diversity and environmental adaptations.
- **Diversity of Vertebrates II.** Amphibians, Reptiles, Birds and Mammals. General compared characters. Diversity and environmental adaptations.

MODULE III: Fundamentals of Animal Physiology

- **Introduction to Animal Physiology.**
- **Intercellular communication.**
- **Electrical excitability I: neurons.**
- **Electrical excitability II: muscle.**
- **Fluid compartments. Blood.**
- **Cardiovascular physiology.**
- **Physiology of breathing.**
- **Renal function.**
- **Physiology of digestion.**
- **Endocrine system.**
- **Reproduction.**
- **Nervous system.**