

Degree programme	Type	Course
Microbiology	FB	1

Contact lecturer

Name : Mariana Teles Pereira

Email : mariana.teles@uab.cat

Teaching staff

Sara Dallares Villar

Group languages

You can consult this information at the [end](#) of the document.

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

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 students 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 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:

1. understand the systematics and phylogenetic relationships among the major animal groups as a result of evolutionary and adaptive processes.
2. know the main levels of organization of animals and their architectural patterns.

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

1. its morphological characteristics,
2. biological cycles,
3. ecological importance, and (IV) interactions with man.

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

1. to know the organization and the anatomical and functional basis of animal physiological systems, with special attention to Humans.
2. to identify the role and importance of major regulatory or control systems.
3. to know the main biophysical, cellular, molecular and biochemical bases of the physiological systems to understand their function.
4. to understand the different physiological systems as highly interrelated and integrated entities.
5. to understand the physiology of animal organisms, particularly humans, as a basis for the development of studies and microbiological applications.

Learning outcomes

- CM05 (Evaluate the global dynamics of natural systems at different scales of analysis to provide innovative responses to societal demands and care for the environment.) Evaluate the global dynamics of natural systems at different scales of analysis to provide innovative responses to societal demands and care for the environment.
- CM06 (Integrate knowledge and skills from the field of biology, working individually and in groups, to prepare and present in writing or orally and publicly a scientific work.) Integrate knowledge and skills from the field of biology, working individually and in groups, to prepare and present in writing or orally and publicly a scientific work.
- KM08 (Define the structure, organization and functioning of the different types of cells, tissues and physiological systems in living organisms.) Define the structure, organization and functioning of the different types of cells, tissues and physiological systems in living organisms.
- KM09 (Describe the taxonomic, morphological and anatomical diversity of the main groups of living organisms and their position within ecosystems.) Describe the taxonomic, morphological and anatomical diversity of the main groups of living organisms and their position within ecosystems.
- SM06 (Relate the main biophysical, cellular, molecular and biochemical bases of physiological systems with their functioning.) Relate the main biophysical, cellular, molecular and biochemical bases of physiological systems with their functioning.
- SM08 (Interpret the bases of evolution and its relationship with the structure and operation of biological systems at all levels of organization.) Interpret the bases of evolution and its relationship with the structure and operation of biological systems at all levels of organization.

Contents

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 parasitic species.
- 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.
- Excitable tissues.
- Nervous system.
- Endocrine system.
- Fluid compartments. Blood.
- Cardiovascular physiology.
- Respiratory physiology.
- Renal function.
- Gastrointestinal physiology.

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Written Reports	10	0.4	CM05, CM06, KM08, KM09, SM06, SM08
Seminars and case studies	9	0.36	CM05, CM06, KM08, KM09, SM06, SM08
Lectures	36	1.44	CM05, CM06, KM08, KM09, SM06, SM08
Bibliographic research	6	0.24	CM05, CM06, KM08, KM09, SM06, SM08
Seminar preparation	2	0.08	CM05, CM06, KM08, KM09, SM06, SM08
Reading texts	6	0.24	CM05, CM06, KM08, KM09, SM06, SM08
Case studies	7	0.28	CM05, CM06, KM08, KM09, SM06, SM08
Personal study and solve problems	59	2.36	CM05, CM06, KM08, KM09, SM06, SM08
Individuals and group tutorials	6	0.24	CM05, CM06, KM08, KM09, SM06, SM08

In this subject, and as reflected in the Methodology section, whenever possible, innovative teaching methodologies will be used -such as Service Learning (APS), Challenge-Based Learning (ABR), flipped classroom, gamification, among others- with the aim of encouraging active student participation and improving teaching-learning processes. The methodology used in this subject to achieve the learning process is based on having students work with the information made available to them. The role of the teaching staff is to provide them with the information or indicate where they can obtain it, guiding and tutoring them so that the learning process can be carried out effectively. To achieve this objective, the subject is based on the following activities:

Lectures:

With these classes the students acquire the basic scientific-technical knowledge of the course that must be complemented with personal study of the topics explained.

Seminars:

The aim of the seminars is to promote the capacity for analysis and synthesis, critical reasoning and the capacity to solve problems. In the seminars, the scientific-technical knowledge exposed in the lectures is worked on to complete and deepen their understanding, developing various activities: videos on zoological themes, resolution of issues related to the topics covered, analysis of ecophysiological and zoological information, etc. ., analysis, discussion and resolution of physiology problems, working in small groups around topics of special interest in animal physiology, zoology, and microbiology.

Attendance at the seminars is mandatory.

Observations: Within the schedule set by the centre or degree program, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

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.

Assessment

Continuous assessment activities

Title	Weight	Hours	ECTS	Learning outcomes
Seminars Animal Physiology	10%	1.5	0.06	CM05, CM06, KM08, KM09, SM06, SM08
Seminars Zoology	12,5%	1.5	0.06	CM05, CM06, KM08, KM09, SM06, SM08
Theory Zoology	37,5%	3	0.12	CM05, CM06, KM08, KM09, SM06, SM08
Theory Animal Physiology	40%	3	0.12	CM05, CM06, KM08, KM09, SM06, SM08

This subject does not include the single assessment system, and there is a continuous evaluation process throughout the course. This includes more than three evaluation activities of different typologies, distributed throughout the course, and none of the activities represents more than 50% of the final grade.

The evaluation of this course is done independently by the two parts of the subject, Zoology and Animal Physiology, and each part represents a 50% of the course. For each part, the evaluation is carried out according to the following criteria:

Evaluation of seminars:

Assessment is carried out on:

- Individual or group work submitted during the seminars or on dates after these.
- Group and/or individual tests, which may be carried out throughout the seminars.
- Other evaluative elements that the teacher deems appropriate.

The grade corresponding to the seminars has a weight of 25% in the Zoology module and 20% in the Animal Physiology module. This activity cannot be retaken.

Evaluation of theory:

Partial exams:

In this part, the knowledge acquired by the students in the subject is assessed individually, as well as their capacity for analysis, synthesis, and critical reasoning. Two partial exams are held in each module of the subject. The minimum grade to pass each partial exam of the same module is 5 out of 10 in Zoology, and 4.5 out of 10 in Animal Physiology. The grade corresponding to theory has a weight of 75% in the Zoology module and 80% in the Animal Physiology module. Each partial exam serves to clear the material covered.

Resit exam:

Students who have not passed any of the partial exams must take the resit exam.

Final considerations:

In both the Animal Biology module and the Animal Physiology module, a grade of 4.5 in the theoretical part allows averaging with the seminars, and the module is considered passed if the average of the theory and the seminars is 5 or higher. The subject can only be passed when the grade in each module is 5 or higher out of 10. The subject is passed with a final grade of 5 or higher out of 10.

To participate in the resit exam, students must have been previously assessed in a set of activities whose weight is equivalent to at least two-thirds of the total grade of the subject or module. Therefore, students will receive a grade of 'Not Assessable' when the assessment activities carried out have a weighting of less than 67% in the final grade.

This subject does not allow for grade improvement.

Repeating students: The grade for the approved parts (theory or seminars) will be maintained for one academic year.

Other considerations

In this course, the use of artificial intelligence (AI) technologies is permitted as an integral part of the development of the assignment, provided that the final result reflects a significant contribution from the student in terms of analysis and personal reflection. The student must clearly identify which parts have been generated using this technology, specify the tools used, and include a critical reflection on how these have influenced the process and the final outcome of the activity. Lack of transparency in the use of AI will be considered a lack of academic honesty and may result in a penalty on the activity's grade, or more severe sanctions in serious cases.

The commission of any irregularity in an assessment event (academic fraud, plagiarism, or improper use of AI, unless such use is expressly authorized in the teaching guide) that may lead to a significant variation in the grade will result in that assessment event being graded as 0. If the teaching guide provides that passing the course requires obtaining a minimum grade in this assessment event, or if several irregularities occur in the assessment events of the same course, the final grade for this course will be 0. Additionally, a disciplinary process may be initiated against the student who commits any of these irregularities.

Bibliography

Infographic on how to search for e-books: <https://ddd.uab.cat/pub/guibib/224929/bibrecdigitals.pdf>

Zoology

AAVV. Història natural dels països catalans. Vols. 8-14. Ed. Enciclopèdia Catalana.

Brusca RC, et al (2022). Invertebrates. 4th ed. Ed. Oxford University Press.

De Iuliis G, Pulerà D (2019). The dissection of Vertebrates. 3rd ed. Ed. Academic Press.

Hickman CP, et al (2020). Integrated Principles of Zoology. 18th ed. Ed. McGraw-Hill.

Kardong KV (2018). Vertebrates: comparative anatomy, function, evolution. 8th ed. Ed. McGraw-Hill.

Pough FH, et al (2019). Vertebrate life. 10th ed. Ed. Oxford University Press.

Animal Physiology

Barrett KE, Barman SM, Brooks HL, Yuan JX-J. Ganong. Fisiología Médica. McGraw-Hill Interamericana de España SL, 26a ed, 2020.

Fox SI. Fisiología Humana. McGraw-Hill Educación, 14a ed, 2017.

Hall JE, Hall ME. Guyton y Hall: Tratado de Fisiología Médica. Elsevier, 14a ed, 2021.

Koeppen BM, Stanton BA. Berne & Levy Physiology. Elsevier, 7a ed, 2017.

Pocock G, Richards CD, Richards DA. Human Physiology. Oxford University Press, 5a ed, 2017.

Silbernagl S, Despopoulos A. Fisiología. Texto y Atlas. Editorial Médica Panamericana, 7a ed, 2009.

Silverthorn, Dee Unglaub. Fisiología humana: un enfoque integrado. Médica Panamericana, 6ª ed, 2014.

Tortora GJ, Derrickson BH. Principles of Anatomy and Physiology. Médica Panamericana, 15a ed, 2021.

Tresguerres J.A.F. Fisiología Humana. McGraw-Hill Interamericana de España SL, 4a ed, 2010.

Widmaier EP, Raff H, Strang KT. Vander's Human Physiology. The Mechanisms of Body Function. McGraw-Hill Education, 15a ed, 2018.

Software

None.

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this [link](#). To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	71	Catalan/Spanish	first semester	afternoon
(PAUL) Classroom practices	711	Catalan/Spanish	first semester	morning-mixed
(PAUL) Classroom practices	712	Catalan/Spanish	first semester	morning-mixed