

**COURSE DATA****Data Subject**

Code	36830
Name	Zoología I
Cycle	Grade
ECTS Credits	6.0
Academic year	2023 - 2024

Study (s)

Degree	Center	Acad. Period year
1106 - Degree in Biology	Faculty of Biological Sciences	1 Annual

Subject-matter

Degree	Subject-matter	Character
1106 - Degree in Biology	5 - Biología	Basic Training

Coordination

Name	Department
BALBUENA DIAZ-PINES, JUAN ANTONIO	355 - Zoology

SUMMARY

The course Zoology 1 is included in the subject Animal Biology, which is compulsory in the biology degree. The course comprises 6 ECTS credits and is taught in the 1st year of the degree. It is complemented by Zoology 2, taught in the 2nd year of the degree. Zoology 1 offers an introduction to the discipline of zoology and is structured around two thematic content blocks.

The first block includes the most general aspects of zoology. The study of the various groups of protists with animal affinities is essential to address the current hypotheses on the origin of metazoans. Likewise, it is necessary to deepen and broaden aspects on animal development and architecture, and on life cycles. In this way, the basis will be established to present the animal classification, which is the final aspect of this block of contents.

The second block presents the biodiversity of non-arthropod protostomes and deals with the study of the most representative phyla of each body plan ("Bauplan"). Not all phyla will be treated, but only those that are most noteworthy for their diversity, public health, ecological or phylogenetic importance.

In addition, the simultaneity of the subjects Zoology 1 and Botany 1 allows coordinating a field trip,



which optimizes resources and facilitates the students' understanding of these subjects, which are dedicated to the description of biodiversity.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

No enrollment restrictions with other curriculum subjects have been specified.

OUTCOMES

1106 - Degree in Biology

- Students must be able to apply their knowledge to their work or vocation in a professional manner and have acquired the competences required for the preparation and defence of arguments and for problem solving in their field of study.
- Students must have the ability to gather and interpret relevant data (usually in their field of study) to make judgements that take relevant social, scientific or ethical issues into consideration.
- Organise, plan and manage information in a manner that allows the individual to analyse, synthesise and develop critical reasoning that can be applied to solve problems, make decisions and carry out work.
- Use ICTs, apps and other computer tools to manage and disseminate information in both educational and professional environments.
- Develop the skills needed to carry out a professional activity with a proactive attitude towards the world of work and with an innovative and entrepreneurial spirit. Be able to apply sustainability criteria and to work within the framework of professional ethics.
- Understand the phylogenetic and geographical relationships of living organisms, as well as their taxonomy and systematics. Apply current scientific techniques to identify organisms and discern their phylogenetic relationships.
- Understand the morphological and functional diversity of living beings. Understand the functions of the basic underlying mechanisms from an integrative point of view and their adaptations to the environment throughout their history.



LEARNING OUTCOMES

Cross-cutting skills

Instrumental

- 1.- To acquire analysis and synthesis skills to be able to gather, in an organized and coherent way, information or data of varied origin through the realization of proposed works tutored and evaluated. Activities: Group tutorials, field trip.**
- 2.- To develop the ability to organize and plan the work and activities (teaching guide, chronogram and agenda, which are available from the first day of the course).**
- 3.- Capacity for oral expression, before a public audience, through the presentation of a short paper or intervention in a debate on a controversial topic or issue. Activities: Group tutorials, lecture-colloquium, etc.**
- 4.- Ability to develop a written text. Activities: Voluntary activities, exams, etc.**
- 5.- To develop knowledge in scientific English through the search, selection and management of bibliography in this language. Activities: reading of complementary scientific articles in theory classes.**

Systemic

- 1.- To develop autonomous and constant learning throughout life. Activities: Elaboration of works, study of contents, search for information, etc.**



2.- To adapt to new situations. Activities: field trip.

3.- To encourage communication and discussion of the contents of the subject in order to stimulate individual creative capacity.

Activities: Tutorials, practicals, field trip.

Personal

1.- To foment the capacity to work in a team. Activities: Group tutorials, practicals, field trip.

2.- To develop the ability to argue from rational criteria, clearly differentiating what is opinionated from what are facts or accepted scientific evidences (critical reasoning). Activities: Group tutorials, face-to-face classes, seminars.

3.- Acquire social and professional awareness about environmental problems and the importance of biodiversity and its conservation (ethical commitment). Activity: Field trip.

4.- To promote skills in interpersonal relationships and ability to interact with both the teacher and classmates. Activities: field trip, group work, internships, lectures, seminars, tutorials, etc.

Specific instrumental skills

- To analyze the basic designs of animal organization (Bauplan) and the principles of animal classification as an introduction to zoological diversity. Acquire practical skills in the use of specific techniques and terminology.

- To know and value animal diversity (form: morphology and



anatomy) and to identify the functional adaptations (function) that allow animals to occupy certain ecological niches, as well as to study the interactions among them and with the environment (animal ecology).

- Identify different animal taxa and develop the techniques of capture, observation, repair and conservation corresponding to the different groups.**
- Analyze the life history, development, biological cycles and types of reproduction in the different animal phyla.**
- Discuss and analyze possible phylogenetic relationships between animal groups based on morphoanatomical, embryological, genetic, biochemical, ecological, etc. evidence (animal phylogeny).**
- Develop applied aspects in the use and management of animals in environmental impact studies (bioindicators) and in various industrial applications, among others.**



DESCRIPTION OF CONTENTS

1. Basic aspects of the animal kingdom

TOPIC 1.- Zoology: concept and limits. The origin of animals. Animal-like protists and their importance.

TOPIC 2.- Development, life cycles and animal architecture. Zoological nomenclature.

TOPIC 3.- Animal phylogeny and classification. Animal biodiversity.

2. Animal diversity

In this block the animal taxa specified in the contents will be studied, following the same format that will include the most relevant aspects on form and function, classification, ecology and phylogeny.

TOPIC 4.- Phylum Porifera. Body organization. Health interest.

TOPIC 5.- Phylum cnidarians. Metagenesis and coral reefs. Phylum ctenophores. Phylum Placozoa.

TOPIC 6.- Bilateria. protostomes. Spiralia: main groups and diversity.

TOPIC 7.- Phylum flatworms. Life cycles. Parasitism. Economic and sanitary importance.

TOPIC 8.- Phylum mollusks. Adaptive radiation. Economic and ecological importance.

TOPIC 9.- Phylum annelids. Metamerism and hydrostatic skeleton.

TOPIC 10.- Ecdysozoa: main groups. Phylum nematodes. Life cycles. Health, economic and ecological importance.

3. Practicals

PRACTICAL 1.- Porifera. Spicular skeleton and diversity.

PRACTICAL 2.- Cnidarians. Anatomy and diversity.

PRACTICAL 3.- Flatworms. Anatomy and diversity.

PRACTICAL 4.- Mollusks I. Morphology and classification.

PRACTICAL 5.- Mollusks II. Dissection of a mollusk.

PRACTICAL 6.- Annelids. Anatomy, locomotion and diversity.

PRACTICAL 7.- Nematodes. Anatomy and diversity.

PRACTICAL 8.- Invertebrate study techniques.

PRACTICAL 9.- Triage and identification of marine invertebrates I.

PRACTICAL 10.- Triage and identification of marine invertebrates II.

Note: The order of the practical sessions may be altered for teaching organizational reasons.

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Laboratory practices	26,00	100
Tutorials	4,00	100
Study and independent work	90,00	0
TOTAL	150,00	

TEACHING METHODOLOGY

- **Participative theoretical classes:** Teachers will present the fundamental concepts of each of the topics. During these sessions, students will be oriented regarding bibliography and resources they can consult. The time needed to teach each of the 10 topics is variable. Some topics may be complemented with video projections and animations.

- **Practical laboratory classes:** 10 laboratory practicals of two hours' duration have been designed. The first seven are focused on specific animal taxa and will be taught in coordination with the theoretical contents. The last three practicals are of a transversal nature and are dedicated to the analysis of the fauna sampled during the field trip to a marine ecosystem. Before each practical, the students will be provided with a script that should be read beforehand. During the session, the teacher will introduce the objective of the practice and remind the students of the basic concepts to be handled. During the rest of the session, students will carry out the practice under the teacher's supervision.

- **Interdisciplinary field trip:** An interdisciplinary field trip will be carried out in coordination with the subject Botany 1 to a coastal marine ecosystem. In the field trip, students will collect specimens for their later analysis in Practical 9 and 10. In these sessions, students will exercise their observation skills, direct and indirect identification of fauna, integration of the data obtained and extraction of general ecological patterns. Students will work in teams of two to four students. The teams must be formed by students of the same practice subgroup.

- **Face-to-face tutorials in small groups (16 students):** The tutorials will be held in two sessions on the dates indicated in the course agenda. A 1-hour tutorial has been planned for the first term, the purpose of which is to explain the objectives, development and evaluation of the interdisciplinary field trip. In the second term, a second tutorial session (3h) will be held. In this session, students will solve questions previously proposed by the professors. These will be aimed at broadening, deepening or clarifying aspects covered by the theoretical classes or to discuss current issues directly related to the subject. Likewise, the presentation of the questionnaires requested in the same will be obligatory.



- **Individual tutorials:** They will be used to solve specific questions or personal problems of the student with the subject. They can be face-to-face, virtual or through e-mail.

- **Voluntary activities:** Students may voluntarily perform other complementary activities to complete their training and active participation in class, always after consulting the professor during the first four-month period.

EVALUATION

There will be a continuous evaluation of each student, based on face-to-face and non-face-to-face activities. The participation in face-to-face activities, the presentation and completion of work and voluntary activities and the participation and involvement in the teaching-learning process will be valued. The aspects that will be assessed will be the following:

- **Written tests on the contents of the course**

There will be an exam on the theoretical and practical contents, which will represent 60% and 40% of the grade, respectively. It will be an indispensable condition to pass the course to achieve at least a score of 5 out of 10 in each of the tests.

- ***Evaluation of the theoretical contents:***

A final exam will be carried out being necessary a minimum qualification of five to eliminate matter. The grade obtained will represent 95% of the grade of the theoretical contents.

- ***Evaluation of group tutorials:***

The final theoretical exam will include questions corresponding to the contents of the tutorials. In addition, the individual and group work done during the tutorials will represent 5% of the grade for the theoretical contents.



- Evaluation of the practical laboratory classes and field trips:

There will be a final exam being necessary a minimum grade of five to eliminate matter. The exam will include questions related to the field trip that the students will have to answer based on their notes and other records (e.g. photographs) taken in situ or during the development of practices 9 and 10.

The theoretical and practical contents passed in the 1st exam will be kept until the 2nd exam.

THE THEORY AND PRACTICAL GRADES WILL NOT BE KEPT FOR THE FOLLOWING YEAR.

Attendance to laboratory practicals, field trips and group tutorials is compulsory. The unjustified absence of 20% of the hours dedicated to each of these activities will result in a zero in the corresponding activity.

- Evaluation of voluntary activities

The grade obtained in the voluntary and complementary activities that the student has carried out during the course will contribute to modulate the final grade of the subject with a maximum value of +1.0 points.

- The grade obtained in the voluntary and complementary activities during the previous course can be kept for the following academic year.

REFERENCES

Basic

- - HICKMAN, C.P.; KEEN, S.L.; EISENHOUR, D.J.; LARSON, A.; LANSON, H. (2021). Principios Integrales de Zoología (18ª Edición). Ed. Edra. Zaragoza.
- MICHELENA, J.M.; J. LLUCH; J. BAIXERAS (2004). Fonaments de Zoologia. Universitat de València. Servicio de Publicaciones. Valencia.
- DIAZ, J.A. & T. SANTOS (1998). Zoología. Aproximación Evolutiva a la Diversidad y Organización de los Animales. Ed. Síntesis, S.A. Madrid.
- DORIT, R.L.; WALKER, W.F. & BARNES, R.D. (1991). Zoology. Ed. Saunders College Publishing. Philadelphia.



Additional

- ALEXANDER, R. McN. (1990). *Animals*. Cambridge University Press. Cambridge.
- BRUSCA, R.C.; GIRIBERT, G.; MOORE, W. (2023). *Invertebrates*. 4th Edition. Oxford University Press. New York.
- KARDONG, K.V. (2007). *Vertebrados: Anatomía Comparada, Función, Evolución* (4 ed.). Ed. McGraw Hill / Interamericana de España, S.A. Madrid.
- GIRIBERT, G. & EDGECOMBE, D. (2020) *Invertebrate Tree of Life*. Princeton University Press, Princeton.
- RUPPERT, E.E. & BARNES, R.D. (1996). *Zoología de los Invertebrados*. Ed. McGraw Hill / Interamericana de España, S.A. Madrid.
- LAVERACK, M.S. & DANDO, S. (1987). *Lecture Notes on Invertebrate Zoology*. Blackwell Scientific Publications. Oxford.
- LINDNER, G. (1977). *Moluscos y Caracoles de los Mares del Mundo*. Ed. Omega. Barcelona.
- MCMAHON, T.A. & BONNER, J. T. (1986). *Tamaño y Vida*. Ed. Labor. Barcelona
- NEEDHAM, J.G. & NEEDHAM, P.R. (1978). *Guía para el Estudio de los Seres Vivos de las Aguas Dulces*. Ed. Reverté. Barcelona.