

Degree programme	Type	Course
Environmental Biology	FB	1

Contact lecturer

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Group languages

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

Prerequisites

It is advisable to review the Zoology concepts covered in the Biology course taken during upper secondary education.

To attend the Zoology practical sessions, students must provide evidence that they have passed the biosafety and safety tests available on the Virtual Campus, and must be familiar with and accept the operating rules of the laboratories of the Faculty of Biosciences.

Objectives

Throughout this course, students are expected to acquire the theoretical and practical knowledge that will provide them with as comprehensive an understanding as possible of the foundations of zoological knowledge and the diversity of non-arthropod invertebrates from an anatomical, functional, systematic and phylogenetic perspective.

Likewise, this knowledge should enable students to place each animal group within an ecological context, taking into account the number of species, habitat and lifestyle, its position within ecosystems, as well as its importance from the perspective of applied sciences and its economic relevance.

The specific learning objectives are:

- To introduce the main concepts that underpin the science of Zoology.
- To understand the systematics and phylogenetic relationships among the main animal groups as the result of evolutionary and adaptive processes.

- To understand the main levels of organisation and body plans of non-arthropod invertebrates.
- To acquire knowledge of the morphological characteristics, life cycles, ecological importance and interactions with humans of the main groups of non-arthropod invertebrates.

Learning outcomes

- CM15 (Integrate the potential of animal diversity in ecosystems, relating it to environmental factors and assessing the environmental impact of human activity.) Integrate the potential of animal diversity in ecosystems, relating it to environmental factors and assessing the environmental impact of human activity.
- CM16 (Communicate knowledge in the field of zoology objectively and clearly, both orally and in writing, to both a specialist and non-specialist audience.) Communicate knowledge in the field of zoology objectively and clearly, both orally and in writing, to both a specialist and non-specialist audience.
- KM20 (Describe the development, growth and biological cycles of animals, as well as their diversity, evolution and relationships according to the ecosystem in which they are found.) Describe the development, growth and biological cycles of animals, as well as their diversity, evolution and relationships according to the ecosystem in which they are found.
- KM21 (Identify animal species by applying current techniques for classifying living organisms.) Identify animal species by applying current techniques for classifying living organisms.
- SM19 (Apply dissection methods to the observation and analysis of the internal anatomy of representative specimens of the main groups of animals.) Apply dissection methods to the observation and analysis of the internal anatomy of representative specimens of the main groups of animals.
- SM20 (Apply sampling techniques to obtain animal specimens and materials for subsequent laboratory analysis.) Apply sampling techniques to obtain animal specimens and materials for subsequent laboratory analysis.
- SM22 (Analyse the origin, evolution and diversity of animals and their behaviour.) Analyse the origin, evolution and diversity of animals and their behaviour.

Contents

BLOCK I. BASIC CONCEPTS OF ZOOLOGY

Lesson 1. Zoology: the concept of the animal. Historical development of Zoology. Disciplines.

Lesson 2. Animal diversity. Species concept. Mechanisms of speciation. Natural, sexual and group selection. Evolution as the generator of diversity. Zoogeographical regions.

Lesson 3. The organisation of the animal kingdom. Classification and nomenclature. Concepts and methods for the study of animals. Animal phylogeny.

Lesson 4. Animal architecture. Levels of organisation. Symmetry. Cephalisation. Metamerism.

Lesson 5. Animal reproduction, development and life cycles.

BLOCK II. DIVERSITY OF NON-ARTHROPOD INVERTEBRATES

Lesson 6. The origin of animals. Animal-like protists.

Lesson 7. Metazoans. Poriferans. Origin. Cellular organisation and morphological types. Ecological importance and applications.

Lesson 8. Cnidarians. Body plans. Alternation of generations. The role of coral reefs.

Lesson 9. Protostomes. Spiralia (Lophotrochozoa). Platyzoans. Platyhelminthes. Life cycles. Adaptation to parasitism.

Lesson 10. Gnathiferans and Lophophorates. Rotifers. Bryozoans. General characteristics and life cycles.

Lesson 11. Trochozoans. Molluscs. The mantle and shell. The radula. The coelomic cavity. General organisation and biology. Major groups of molluscs. Adaptive strategies. Importance of the group.

Lesson 12. Annelids. Metamerism and the hydrostatic skeleton. Diversity and adaptations to the environment.

Lesson 13. Ecdysozoans. Nematodes. Function of the pseudocoelom. Biological importance and adaptations to parasitism.

Lesson 14. Deuterostomes. Echinoderms. Pentaradial symmetry. Water vascular system. Diversity.

PRACTICAL CLASSES

Laboratory practicals

- Practical 1. Observation of freshwater microfauna and protozoans. Observation and identification of poriferans and cnidarians.
- Practical 2. Observation and identification of platyhelminths and nematodes.
- Practical 3. Observation and identification of molluscs.
- Practical 4. Observation and identification of annelids and echinoderms.

Field practical

- Practical 5. Sampling and observation of marine invertebrates.

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Study and preparation for practical sessions	52	2.08	KM20, KM21, SM22
Lectures	33	1.32	CM15, CM16, KM20, KM21, SM22
Seminars	7	0.28	CM15, CM16, KM20, KM21, SM22
Laboratory practical classes	8	0.32	KM21, SM19, SM22
Fieldwork	4	0.16	CM15, SM20, SM22
Written Reports, answer to questions	32	1.28	CM15, CM16, KM21, SM22
Tutorships	6	0.24	CM15, CM16, SM22

The teaching methodology used in this course is based on students actively working with the information made available to them. The role of the teaching staff is to provide this information or indicate where it can be obtained, as well as to guide and tutor students so that the learning process can be carried out effectively. To achieve this objective, the course is organised around the following learning activities:

Lectures

Through these sessions, students acquire the basic scientific and technical knowledge of the course, which they are expected to complement through personal study of the topics covered.

Seminars

The seminars develop the scientific and technical knowledge presented in the lectures in order to consolidate understanding and explore the topics in greater depth through a range of activities, including the analysis and discussion of videos on zoological topics, the resolution of questions related to the subjects covered, the analysis of zoological information, and other similar activities.

These seminars use innovative teaching methodologies based on gamification and the flipped classroom approach.

The purpose of the seminars is to promote analytical and synthesis skills, critical thinking and problem-solving abilities.

Practical sessions

Before each laboratory session, students prepare the practical work using the virtual learning materials specifically developed for the course and available on the Virtual Campus.

During the practical sessions, students work with zoological material in the laboratory (observation of preparations and specimens, study of the anatomy and morphology of different groups, dissections, identification of specimens, etc.) and in the field (sampling techniques for invertebrate fauna), complementing this work with the study and completion of the questions included in the practical guide.

The aim of the laboratory and field practical sessions is to consolidate and reinforce the zoological knowledge acquired during lectures and seminars. These practical sessions foster empirical skills such as observation, analysis and recognition of zoological diversity.

Tutorials

The purpose of these sessions is to answer questions, review basic concepts not covered in class and guide students in the use of the consulted sources. The timetable for individual tutorials is arranged with the teaching staff through the Virtual Campus.

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
Partial exam I (final exam I)	30%	1.75	0.07	CM15, CM16, KM20, KM21, SM22
Individual and group-work evaluations at the seminars.	20%	3	0.12	CM15, CM16, KM21, SM22
Partial exam II (final exam II)	30%	1.75	0.07	CM15, CM16, KM20, KM21, SM22
Visu exam	5%	0.5	0.02	KM20, KM21
Evaluation of laboratory practices	15%	1	0.04	KM21, SM19, SM20

To pass the course, the combined marks for theory, seminars and practical sessions must total at least 5.0 out of 10.

IMPORTANT: Attendance at practical sessions and seminars is compulsory. Failure to attend practical sessions or seminars will mean that students CANNOT pass the course.

1- CONTINUOUS ASSESSMENT

The scheduled continuous assessment activities are as follows:

1.1- THEORY

1.1.A. Mid-term theory examinations: Each of the two mid-term examinations will account for 30% of the final mark. These examinations will assess the knowledge acquired throughout the course, as well as students' analytical, synthesis and critical thinking skills. The examination will include multiple-choice questions, short-answer questions, conceptual questions and/or diagrams.

To exempt students from a section of the syllabus in the mid-term examinations, a minimum mark of 5.0 must be obtained in each examination. Students obtaining a mark below 5.0 in either mid-term examination may resit the failed examination during the resit examination. If the failed examination is not passed in the resit, the theory mark cannot be averaged with the marks obtained in the other course assessment activities.

1.1.B. Theory resit examination: This examination allows students to resit any failed mid-term theory examinations.

- To be eligible for the resit examination, students must have completed assessment activities corresponding to at least two thirds of the total assessment activities of the course.
- For the theory component to be averaged with the practical and seminar components, a minimum mark of 4.0 must be obtained in each resit examination.
- Students wishing to improve the mark obtained in one or both theory examinations may sit the final examination, but the previous mark(s) will be forfeited.

1.2- SEMINARS

Assessment will include both the short assignments (questions) submitted during the seminar sessions and the assessment activities (group and individual) carried out throughout the seminars. The seminar component will account for 20% of the final course mark.

- Attendance at seminars is compulsory.
- This assessment activity is not recoverable.
- For the seminar component to be averaged with the other course components, the average seminar mark must be 4.0 or higher.

1.3- PRACTICAL SESSIONS

Laboratory practicals and field trips: Practical sessions account for 15% of the final course mark.

Each practical session includes two assessment activities. Before each session, students must complete a compulsory assessment on the preparatory material. This assessment accounts for one third of the mark for the corresponding practical session. Failure to complete this assessment within the established period may

result in a mark of 0.0 for the corresponding practical session. At the end of each practical session, students must complete an assessment questionnaire on the practical work carried out. This questionnaire accounts for the remaining two thirds of the mark for that practical session.

- Attendance at laboratory practical sessions and field trips is compulsory.
- This assessment activity is not recoverable.
- For the practical component to be averaged with the other course components, the average mark obtained in the practical questionnaires must be 4.0 or higher.

1.4- VISU

Visu identification test: This assessment accounts for 5% of the final course mark. Students will be presented with a list of invertebrate species studied during lectures, seminars or practical sessions and will be required to identify them.

- This assessment activity is not recoverable.
- No minimum mark is required in this component for it to be averaged with the other course components.

SUMMARY OF THE WEIGHTING OF EACH ASSESSMENT COMPONENT:

Theory - Mid-term examination 1	30%
Theory - Mid-term examination 2	30%
Seminars	20%
Practical sessions	15%
Visu identification test	5%

2- SINGLE ASSESSMENT

Students who choose the single assessment option must apply for it within the deadline and according to the procedure established by the Faculty.

2.1- THEORY

This component accounts for 60% of the final course mark and will be assessed by means of:

Single theory examination: The single assessment for the theory component consists of an examination that will be held on the date of the second mid-term examination of the course. The examination will include multiple-choice questions, short-answer questions, conceptual questions and/or diagrams.

Theory resit examination: The resit examination for the single assessment will take place on the same date and at the same time as the resit examination for the continuous assessment.

- To be eligible for the resit examination, students must have completed assessment activities corresponding to at least two thirds of the total assessment activities of the course.
- For the theory component to be averaged with the practical and seminar components, the mark obtained in the theory examination must be 4.0 or higher.
- Students wishing to improve their mark may sit the resit examination, but the previous mark will be forfeited.

2.2- SEMINARS

IMPORTANT: Even if students choose the single assessment option, they must attend the seminars for this course in person.

Assessment will include both the short assignments (questions) submitted during the seminar sessions and the assessment activities (group and individual) carried out throughout the seminars. The seminar component will account for 20% of the final course mark.

- Attendance at seminars is compulsory.
- This assessment activity is not recoverable.
- For the seminar component to be averaged with the other course components, the average seminar mark must be 4.0 or higher.

2.3- PRACTICAL SESSIONS

IMPORTANT: Even if students choose the single assessment option, they must attend the practical sessions of this course in person. Attendance at the practical sessions is **COMPULSORY** and **ESSENTIAL** in order to sit the single theory examination.

The practical sessions account for 15% of the final course mark.

Each practical session includes two assessment activities. Before each session, students must complete a compulsory assessment on the preparatory material. This assessment accounts for one third of the mark for the corresponding practical session. Failure to complete this assessment within the established period may result in a mark of 0.0 for the corresponding practical session. At the end of each practical session, students must complete an assessment questionnaire on the practical work carried out. This questionnaire accounts for the remaining two thirds of the mark for that practical session.

- Attendance at laboratory practical sessions and field trips is compulsory.
- This assessment activity is not recoverable.
- For the practical component to be averaged with the other course components, the average mark obtained in the practical questionnaires must be 4.0 or higher.

2.4- VISU

Visu identification test: This assessment accounts for 5% of the final course mark. The single assessment of the visu component consists of an examination that will be held on the date of the second mid-term examination of the course. Students will be presented with a list of invertebrate species studied during lectures, seminars or practical sessions and will be required to identify them.

- This assessment activity is not recoverable.
- No minimum mark is required in this component for it to be averaged with the other course components.

SUMMARY OF THE WEIGHTING OF EACH ASSESSMENT COMPONENT:

Theory - Mid-term examination 1	30%
Theory - Mid-term examination 2	30%
Seminars	20%
Practical sessions	15%
Visu identification test	5%

3. IMPORTANT CONSIDERATIONS

To pass the course, the final weighted grade must be 5.0 out of 10 or higher.

Not assessable: Students who complete less than 50% of the assessment activities described above will receive a Not Assessable grade.

Students who do not pass the theoretical component of the course but successfully complete the practical component and/or seminars (obtaining a minimum mark of 5.0 out of 10) will retain this mark for a period of three additional enrolments, although they will be required to re-enrol in the entire course.

Students who are unable to attend an individual assessment activity for justified reasons (such as illness, the death of a family member up to the second degree of kinship, an accident, or holding elite athlete status and having to participate in an official competition or compulsory sporting event, etc.) and who provide the corresponding official documentation to the teaching staff and the degree coordination (official medical certificate explicitly stating the inability to sit the examination, police report, certification from the relevant sports authority, etc.) will be entitled to take the assessment on an alternative date. The degree coordination will ensure that this assessment is organised, following consultation with the teaching staff responsible for the course.

Grade improvement: Students who have passed the theoretical component and obtained a mark higher than 4.0 in both the practical component and the seminars may sit the resit examination in order to IMPROVE THEIR GRADE in the theoretical component. To do so, they must formally renounce their previous mark in writing (by email) and notify the teaching staff responsible for the course at least three days before the resit examination. The mark that will be considered for the theoretical component will be that obtained in the last examination taken by the student.

Use of Artificial Intelligence Technologies: For this course, the use of Artificial Intelligence (AI) technologies is permitted exclusively for support tasks, such as literature searches or information retrieval. Students must clearly identify which parts of their work have been generated using this technology, specify the tools used, and include a critical reflection on how these tools have influenced both the process and the final outcome of the activity. Failure to disclose the use of AI in this assessable activity will be considered a breach of academic integrity and may result in a partial or total reduction of the mark for the activity, or more severe disciplinary sanctions in serious cases.

Irregularities in Assessment Activities: Any irregularity committed during an assessment activity (including academic fraud, plagiarism, or the improper use of Artificial Intelligence (AI), unless such use is expressly authorised in the course guide) that may lead to a significant alteration of the assessment result will result in that assessment activity being awarded a mark of 0. If the course guide establishes that obtaining a minimum mark in that assessment activity is an essential requirement for passing the course, or if multiple irregularities are committed in the assessment activities of the same course, the final grade for the course will be 0. In addition, disciplinary proceedings may be initiated against any student who commits any of these irregularities.

Bibliography

Basic Resources:

- Integrated Principles of Zoology. Hickman, C.Jr., Keen, S., Larson, A., Eisenhour, D., l'Anson, H., Roberts, L., 2020 (última edición: 18ª edición). McGraw-Hill Education, Washington, EEUU.
- https://bibcercador.uab.cat/permalink/34CSUC_UAB/1eqfv2p/alma991010766125406709
- **Invertebrates**. Brusca, R.C., Moore, W., Shuster, S.M., 2016 (última edición: 3ª edición). McGraw-Hill Education, Washington, EEUU.
- **Invertebrats no Artròpodes, volumen 8. Història Natural dels Països Catalans**. Altaba, C.R., Alòs, C., Alvà, V., Armengol, J., Baguñà, J., et al., 1991. Editorial Enciclopèdia Catalana. Barcelona.
- **Fauna i flora de la mar Mediterrània**. Ballesteros, E., Llobet, T., 2015. Editorial Brau. Barcelona.

Complementary resources:

- **I. Complementary theory Textbooks:**
 - Anderson, D.T., 2001. Invertebrate Zoology. Oxford University Press. 2ª edición, (referencia en biblioteca UAB: 592 Inv Reimp. 2010).
 - Barnes, R.S.K., 2009. Zoología de los Invertebrados. Editorial MacGraw-Hill/ Interamericana. 7ª edición (referencia en biblioteca UAB: 592 Bar).
 - Barnes, R.S.K., Calow, P., Olive, P.J.W., 1988. The Invertebrates: a new synthesis. Editorial Blackwell Scientific Publications (referencia en biblioteca UAB: 592 Bar).
 - Meglitsch, P.A., Schram, F.R., 1991. Invertebrate Zoology. Oxford University Press, New York (referencia en biblioteca UAB: 592 Meg).
 - Miller, S.A., Harley, J.H., 2015. Zoology. Editorial MacGraw-Hill. 10ª edición (referencia en biblioteca UAB: 59 Mil).
- **II. Complementary practices Guides and Textbooks:**
 - Bergbauer, M., Humberg, B., 2002. Flora y fauna submarina del mar mediterráneo. Ed. Omega.
 - Grassé, P.P., 1982. Manual de Zoología. I. Invertebrados. Ed. Toray-Masson.
 - Munilla, T., 1992. Prácticas de Zoología General I. Invertebrados no Artrópodos. Ed. Oikos-Tau.
 - Needham, J.G., Needham, P., Altimira, C., 1978. Guía para el estudio de los seres vivos de las aguas dulces. Ed. Reverte.
 - Ocaña, A., Sánchez, L., 2000. Guía submarina de invertebrados no artrópodos. Ed. Comares.
 - Riedl, R., 2000. Fauna y flora del mar Mediterráneo. Omega, Barcelona.
- **III. Consultation web pages:**
 - Animal Diversity Web (University of Michigan): <https://animaldiversity.org/>
 - Discover Life: <https://www.discoverlife.org/>
 - International Commission on Zoological Nomenclature: <https://www.iczn.org/>
 - Museo Nacional de Ciencias Naturales (Madrid): <https://www.mncn.csic.es/es>
 - Natural History Museum (Londres): <http://www.nhm.ac.uk/>
 - Shape of Life. The Story of the Animal Kingdom (Sea Studios Foundation): <https://www.shapeoflife.org/>
 - Tree of Life Web Project: <http://tolweb.org/tree/>
 - University of California Museum of Paleontology (EEUU): <https://ucmp.berkeley.edu/>
 - World Register of Marine Species: <http://www.marinespecies.org/>
 - World Wildlife Foundation: <http://www.wwf.es/>

Software

No specific software is required.

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	21	Catalan/Spanish	second semester	afternoon
(PAUL) Classroom practices	211	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	211	Catalan/Spanish	second semester	morning-mixed
(PCAM) Field practices	211	Catalan/Spanish	second semester	morning-mixed
(PCAMs) Suport a les pràctiques de camp dirigides	211	Catalan/Spanish	second semester	morning-mixed
(PAUL) Classroom practices	212	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	212	Catalan/Spanish	second semester	morning-mixed
(PCAM) Field practices	212	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	213	Catalan/Spanish	second semester	morning-mixed
(PCAM) Field practices	213	Catalan/Spanish	second semester	morning-mixed