Advanced Zoology
Code: 100837
ECTS Credits: 6

Degree
2500251 Environmental Biology

Type
OB

Year
2

Semester
1

Contact
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Email: Jacint.Ventura.Queija@uab.cat

Use of Languages
Principal working language: spanish (spa)
Some groups entirely in English: No
Some groups entirely in Catalan: No
Some groups entirely in Spanish: No

Prerequisites
There are no official prerequisites.

Objectives and Contextualisation
This subject supposes a first step in the acquisition of the morphological and systematic concepts that make possible an understanding of the Arthropods and the Chordates from a zoological perspective; in it, students must consolidate the theoretical-practical doctrinal basis of the diversity of both groups. It is therefore a previous and necessary subject for further study, in greater detail, of both animal groups; it corresponds to other subjects (of greater specialization) to locate both groups in an ecological context, as well as to analyze their interest in the applied field and in the economic one. The specific training objectives are:
- To know the basic structural pattern of the Arthropods (of the Insects, especially) and of the Chordates (of the Vertebrates especially); know, also, the modifications of the different systems in the main subgroups of Vertebrates and Insects.
- Know the differential and defining features of the main groups of Arthropods and Chordates.
- Obtain a preliminary view of the main phylogenetic hypotheses that aim to explain the processes of diversification leading to the current groupings (major groups) of Arthropods and Chordates.

Competences
- Communicate efficiently, orally and in writing.
- Develop a sensibility towards environmental issues.
- Identify organisms and recognise the different levels of biological organisation.
- Obtain, observe, handle, cultivate and conserve specimens.
- Recognise and analyse phylogenetic relations.
- Recognise and interpret the development, growth and biological cycles of the principal groups of living beings.

Learning Outcomes
1. Collect and identify animal organisms.
2. Communicate efficiently, orally and in writing.
3. Develop a sensibility towards environmental issues.
4. Interpret the evolutionary processes that have led to animal diversity.
5. Recognise and interpret the different phases in the biological cycles of all animal groups.
6. Recognise and interpret the different states of development of the principal animal groups.

Content

**ARTHROPODS**

Unit 1.- What is an Arthropod? Definition of Arthropod. Positional characters. Traits of Arthropodization. Presentation of the large groups. Position of the Arthropods in the animal world.

Unit 2.- The cuticle and the moult. The layers of the integumentary system. Structure of the cuticle. Cuticle formations and coloration. Cuticle functions. Moulting or ecdysis.


Unit 7.- Crustaceans. Basic characters of Crustaceans. Main groups: Branchiopods, Ostracods, Copepods, Hoplocarids, Peracarid Malacostracans and Eucarid Malacostracans.

Unit 8.- Myriapods. Main groups of Myriapods: Diplopods and Chilopods.


**CHORDATES**

Unit 10.- Chordates. Position of the Chordates within the animal world, abundance and diversity. Basic characters and general organization.

Unit 12.- Cephalochordates. Diagnostic characters. General organization and development.


Unit 16.- The expansion of terrestrial vertebrates. Evolutionary criteria for the diagnosis of large groups of Amniotes. The first Amniotes. The concept of "Reptile". Anapsida: Chelonia. Diagnosis characters and diversity of the diapsids. Lepidosauria: Sphenodontia and Squamata.


PROGRAM OF LABORATORY PRACTICES

Practice 1.- External organization of Chelicerates and Crustaceans. Recognition of differential morphological characters on specimens of the main groups. Dissection of a Mantis Shrimp.

Practice 2.- Diversity of Crustaceans. Recognition of differential morphological characters on specimens of the main groups.

Practice 3.- External organization of Myriapods and Hexapods. Recognition of differential morphological characters on specimens of the main groups. Dissection of a cricket.

Practice 4.- Diversity of Hexapods. Recognition of differential morphological characters on specimens of the main groups.

Practice 5.- Observation and interpretation of the anatomy of Cephalocordates (Branchiostoma lanceolatum). Observation of oozooids of ascidians (Urochordates). Dissection of a specimen of rainbow trout (Vertebrates).
Practice 6.- Observation of external anatomical characters of specimens of Chondrichthysans and Osteichthysans, and classification of them.

Practice 7.- Observation of external anatomical characters of Urodeles and Anurans (Amphibians), as well as Saurians and Ophidians (Amniotes), and classification of them.

Practice 8.- Observation and interpretation of vertebrae, skulls and girdles of Mammals.

**Methodology**

To achieve the objectives set for this subject and regulate their learning, the following activities are proposed:

**Lectures**

With the lectures the students are provided with the basic knowledge of the subject, which obviously has to be acquired and complemented with the personal study of the topics explained. The lectures are, together with the practical classes, the axis on which they structure the knowledge that the students must acquire.

**Laboratory Practices**

In the practical sessions the students will work, in the laboratory, the zoological material of the groups under study (observation and analysis of preparations and specimens, dissections, taxonomical identification of specimens, etc.). For its correct execution, the students will be provided with a guideline or script for each of the sessions presented.

**Seminars**

In the seminars some knowledge exposed in the theoretical classes is worked on, with the intention of completing their correct understanding and deepening them, developing diverse activities that promote the analysis and synthesis capacity, as well as the critical reasoning of the student.

**Tutorials**

In a complementary way, the students will have additional hours of personalized attention by the teacher, in order to answer questions, clarify basic concepts and guide them about the documentary sources that have been recommended.

**Activities**

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<th>Title</th>
<th>Hours</th>
<th>ECTS</th>
<th>Learning Outcomes</th>
</tr>
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<tr>
<td>Laboratory practices</td>
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<tr>
<td>Preparation of works</td>
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<td>1.48</td>
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Assessment

The evaluation of the subject will be done as follows:

1. - Theoretical exams
- Midterm exams: Two midterm exams will be carried out (one by Arthropods and the other by Chordates).
- Final exam: Those who do not pass any of the midterms exams (minimum score: 5 out of 10) must recover the parts not passed in a final exam. Likewise, students who wish to improve the grade of one or both of the parties may do so by taking the final exam, although the previously obtained grade will be lost. To participate in the recovery, students must have been previously evaluated in a set of activities the weight of which equals a minimum of two thirds of the total grade of the subject or module.

2. - Laboratory practices
At the end of each block of related practices (Arthropods and Chordates), the student will perform an individual written test on its contents in the terms indicated by the corresponding teacher.

3. - Seminars
Understanding the seminars as a reinforcement of the theoretical knowledge, its evaluation will be integrated in the theoretical tests (midterm and final exams) and practices.

4. - Final grade
To pass the subject it will be necessary to pass with a mark of 5 (out of 10) or higher each of the two parts of the subject (Arthropods and Chordates). In each part, the theory mark (80% of its value over 10) will be added to that of practices (20% of its value over 10). Once the two parts of the subject have been approved, the resulting final mark will be the arithmetic mean of the marks obtained in each part.

Final consideration
The rating of "Not Evaluable" will be assigned to a student when, without just cause, he/she lacks assessment in any of the activities to be evaluated (provided that this is equal to or greater than 67% of the total assessment). Students who can not attend an individual evaluation test for just cause (such as, for example, an illness, death of a first-degree relative, or accident) and provide the corresponding official documentation to the Grade Coordinator, will have the right to perform the test on another date.

Assessment Activities

<table>
<thead>
<tr>
<th>Title</th>
<th>Weighting</th>
<th>Hours</th>
<th>ECTS</th>
<th>Learning Outcomes</th>
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<td>Seminars</td>
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<td>0</td>
<td>2, 4, 6, 5, 3</td>
</tr>
</tbody>
</table>

Bibliography

ARTHROPODS


**CHORDATES**


Hildebrand, M. *Analysis of Vertebrate structure*. John Wiley & Sons.


**Some web pages of interest**

- Animal Diversity Web: [http://animaldiversity.ummz.umich.edu/](http://animaldiversity.ummz.umich.edu/)
• California Academy of Sciences: http://www.calacademy.org

• Comissió Internacional de Nomenclatura Zoològica: http://www.iczn.org/

• FishBase: http://www.fishbase.org

• Museu Nacional de Ciències Naturals de Madrid (CSIC): http://www.mncn.csic.es/

• Natural History Museum, Londres: http://www.nhm.ac.uk/