



IDENTIFYING DATA

Zoology 2: Arthropod invertebrates and chordates

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|---------------------|---|-----------|------|------------|
| Subject | Zoology 2: Arthropod invertebrates and chordates | | | |
| Code | V02G031V01210 | | | |
| Study programme | Grado en Biología | | | |
| Descriptors | ECTS Credits | Choose | Year | Quadmester |
| | 6 | Mandatory | 2nd | 2nd |
| Teaching language | #EnglishFriendly Spanish Galician English | | | |
| Department | | | | |
| Coordinator | Iglesias Briones, Maria Jesús Mato de la Iglesia, Salustiano | | | |
| Lecturers | Garrido González, Josefa Iglesias Briones, Maria Jesús Kim , Sin-Yeon Mato de la Iglesia, Salustiano Noguera Amoros, Jose Carlos | | | |
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| Web | http://http://bioloxia.uvigo.es/es/docencia/horarios | | | |
| General description | According to its academical denomination this course deals with two animal phyla, phylum Arthropoda with joint appendages and phylum Chordata with an axial skeleton (notochorda), segmented muscles, pharyngeal slits, endostile or thyroid gland and postanal tail. | | | |

Training and Learning Results

| | |
|------|--|
| Code | |
| A3 | Students should prove ability for information-gathering and interpret important data (usually within their study field) to judge relevant social, scientific or ethical topics. |
| A4 | Students should able to communicate information, ideas, issues and solutions to all audiences (specialist and unskilled audience). |
| B1 | Developing autonomous learning by identifying their own training need and organizing and planning tasks and time. |
| B6 | Develop analysis and synthesis, critical reasoning and argumentation skills, applying them in Biology and other scientific-technical disciplines. |
| C1 | Solve problems by applying the scientific method, the concepts and terminology specific to biology, mathematical models and statistical and computer tools. |
| C2 | Identify levels of organisation of living beings through the study of current specimens and fossils. Carry out phylogenetic analyses and study the mechanisms of heredity, evolution and biodiversity. |
| C6 | Understanding and integrate the functioning of living beings (cellular, tissue, organ and individual level), explaining their homeostatic and adaptive responses. |
| C7 | Sampling, characterising, cataloguing and managing natural and biological resources (populations, communities and ecosystems). |
| C9 | Identify resources of biological origin and assess their efficient and sustainable use in order to obtain products of interest. Propose and implement improvements in production systems. |
| D3 | Commitment to sustainability and the environment. Equal, sensible and efficient use of resources. |
| D4 | Collaborate and work in teams or multidisciplinary groups, promote negotiation skills and the ability to reach agreements. |
| D5 | Communicate effectively and appropriately, including the use of computer tools and English. |

Expected results from this subject

| Expected results from this subject | Training and Learning Results | | | |
|--|-------------------------------|----------|----------------------|----------------|
| | A3 | B6 | C2 | D3 |
| To know the origin and evolution of animals: the body plans, the position of the distinct groups along the evolutionary tree and the rules of the zoological nomenclature. | A3 A4 | B6 | C2 | D3 |
| To know the biodiversity and the organisms' abilities to adapt to their environment: species identification (use of dichotomous keys) and analysis of animal behaviour | A3 A4 | B1 | C1 C2 C6 C7 | D3 |
| To know and compare the anatomy and physiology of the different animal groups: morphological adaptations, strategies of capture and food foraging, developmental biology and biological cycles | A3 A4 | B6 | C2 C6 C9 | D3 |
| To apply the acquired knowledge in zoology to manipulate and analyse specimens and samples of biological origin, with the aim of cataloging, evaluating, designing and interpreting biological models; to elaborate management measures for species control and for the design of adequate plans that could ensure their conservation and the restoration of their habitats. | A3 A4 | B1 B6 | C1 C7 C9 | D3 D4 D5 |
| To apply knowledge and techniques in those areas specialised in producing and exploiting resources of animal origin; awareness of animal welfare and ethical commitment when studying and using animals | A3 A4 | B6 | C1 C7 C9 | D3 D4 D5 |
| To understand the social projection of zoology and its impact in the professional world, as well as to know how to disseminate contents (orally and written) in academic and scientific fields and in any other forum of dissemination. | A3 A4 | B6 | C9 | D3 D4 D5 |

Contents

| Topic | |
|--|--|
| Presentation: General organisation of the course | Organisation of the course. Introduction and justification of the phylogenetic scheme adopted. |
| I. Panarthropoda | Phylogenetic considerations of Panarthropoda Phylum Tardigrada. External and internal morphology. Phylum Onychophora. External and internal morphology. |
| II. Phylum Arthropoda | General characteristics Subphylum Chelicerata Subphylum Miriapoda Subphylum Crustacea Subphylum Hexapoda |
| III. Phylum Chordata | Exclusive characteristics Subphylum Cefalochordata Subphylum Urochordata Subphylum Vertebrata |
| IV. Phylum Chordata: Craneata | Subphylum Vertebrata (Vertebrates except Tetrapods) Class Mixini Class Petromizontidae Class Chondrichthyes Class Actinopterygii Class Sarcopterygii |
| IV. Phylum Chordata: Craneata | Subphylum Vertebrata (Tetrapod Vertebrates) Class Amphibia Class non Avian Reptiles Class Aves Class Mammals |
| Laboratory Exercises | I. Morphological study of Arthropods I. II. Morphological study of Arthropods II. III. Morphological study of Vertebrates I. IV. Morphological study of Vertebrates II. V. Morphological study of Vertebrates III. VI. Field trip. Observation in situ of different groups of arthropods and chordates. |

Planning

| | Class hours | Hours outside the classroom | Total hours |
|--------------------------|-------------|-----------------------------|-------------|
| Lecturing | 28 | 42 | 70 |
| Laboratory practical | 15 | 30 | 45 |
| Case studies | 0 | 16 | 16 |
| Seminars | 3 | 0 | 3 |
| Objective questions exam | 1 | 7 | 8 |
| Objective questions exam | 1 | 7 | 8 |

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

| Methodologies | |
|----------------------|--|
| | Description |
| Lecturing | Theoretical contents related by the professor in the classroom. "Teaching starts in the classroom and ends in the books". |
| Laboratory practical | The practical exercises are complementary to the lectures and will provide a hands-on training to the diversity of arthropod invertebrates and chordates as well as their anatomy and how to identify them |
| Case studies | Resolution of problem-solving assignments and questionnaires using the online learning platform. They are intended to evaluate the transversal competences acquired by students (i.e. synthesis, critical thinking, creativity) included in the syllabus |
| Seminars | They can be used to solve any problems that could arise during the course. They will include complementary activities addressing some of the theoretical-practical aspects. Tasks aiming at acquiring academic English skills will be implemented. |

Personalized assistance

| Methodologies | Description |
|----------------------|--|
| Lecturing | Group tutorials do not allow a personalized follow-up but they are a good mechanism to consult any doubts and enable the teacher to share the students' difficulties. In a system in which the burden of learning falls on the student, close follow-up is essential if learning and study are to be continuous and progressive. Therefore, individual tutorials (Monday, Tuesday and Wednesday 09:30-11:30) will also be used to monitor the development of the subject and resolution of any questions that may arise. Student tutorials could also be done virtually (email, videoconference) by mutual agreement between the lecturer and the student. |
| Laboratory practical | Tutorials (Monday, Tuesday and Wednesday 09:30-11:30) will be used to solve any questions that may arise. |
| Seminars | Tutorials (Monday and Tuesday 09:00-12:00) will be used to solve any questions that may arise. |
| Case studies | Tutorials (Monday, Tuesday and Wednesday 09:30-11:30) will be used to solve any questions that may arise. |

Assessment

| | Description | Qualification | Training and Learning Results |
|--------------------------|---|---------------|---|
| Laboratory practical | Attendance is compulsory and the students' active participation will also be positively considered. These sessions will be evaluated based on a written examination of the practical contents at the end of each practical session. | 20 | A3 B1 C2 A4 C7 |
| Case studies | There will be three problem-solving assignments altogether, which will consist of the resolution of theoretical and/or practical aspects related to each of the thematic units. Each one of them allows the teacher to evaluate the student's efforts during the course. They will be available on the online learning platform for at least a week (exact dates will be agreed upon by the students and the teacher). Each of these activities will be evaluated on a scale from 1 to 10 and at the end of the course finally averaged to obtain the final score | 10 | A3 B1 C1 D3 A4 B6 D5 |
| Seminars | Attendance and active participation in the debates during these sessions are mandatory. The seminars will be evaluated by the resolution of a case study. The content and the quality of the report will also be considered. | 10 | A3 B1 C1 D3 A4 B6 C9 D4 D5 |
| Objective questions exam | The first assessment will be take place during the teaching period (30%). The student will have to answer several questions related to the phylum Arthropoda. It will cover the material provided during the lectures and aims at evaluating the extent of knowledge acquisition. The format of this exam will be short-answer questions, filling gaps with a few words or drawing a diagram to explain a particular structure or physiological function of a particular animal. | 30 | A3 B1 C1 D3 A4 B6 C2 D4 C6 D5 C7 C9 |
| Objective questions exam | The second assessment (30%) will take place on the official date established by the Faculty. The student will have to answer several questions related to the phylum Chordata. It will cover the material provided during the lectures and aims at evaluating the extent of knowledge acquisition. The format of this exam will be short-answer questions, filling gaps with a few words or drawing a diagram to explain a particular structure or physiological function of a particular animal. | 30 | A3 B1 C1 D3 A4 B6 C2 D4 C6 D5 C7 C9 |

Other comments on the Evaluation

The dates for the written exams of the theoretical aspects of the course will coincide with the official dates stated in the assessment schedule of the Faculty (May and July attempts), which can be found on the faculty website:
<http://bioloxia.uvigo.es/en/teaching/exams>

The written exams of the practical aspects of the subject will be done at the end of each of the practical classes. The scores obtained during the continuous evaluation (seminars, laboratory exercises, on-line activities) will be maintained for the second and extra attempts scheduled for the current academic year.

The final grade will be obtained as the sum of the different evaluation components (after calculating the percentages assigned), as long as each part of the total evaluation (theory, lab sessions, seminars and assignments) had been passed with a minimum value of 5.0. In the case of students not achieving the mark of 5 in either of these components, the score obtained in the failed component will become the numeric final grade.

In addition, the teacher may propose extra (voluntary) activities for those students willing to increase the average grade obtained. They will be announced throughout the semester and therefore, it is the student's obligation to stay informed throughout this period.

Students will also have the choice to take a final exam of 100% of the subject contents (instead of the continuous evaluation procedure) as long as they have attended all the laboratory sessions. There will be a period to select this modality, which will be established by the faculty.

A student will receive a grade of "not presented" (NP) when he/she has not attended the final written exam that will be held in the two official calls (first and second call) and if he/she does not perform any of the other activities included in the continuous evaluation procedure (i.e., seminars, laboratory exercises, on-line assignments).

If a student fails some elements of the course, he/she may still be able to progress to the next year by repeating all those elements of the continuous evaluation procedure that were not passed first time. However, students need to consult with the professors if only failed elements will be re-taken/deferred and upon which conditions.

Cheating and plagiarism in any of the different activities of the evaluation could result in failing the activity and/or the entire course.

Sources of information

Basic Bibliography

Hickman CP, Roberts LS, Larson A, l'Anson H and Eisenhour DJ, **Integrated Principles of Zoology**, 16, McGraw-Hill, 2014

Brusca RC, Moore W and Shuster SM, **Invertebrates**, 3, Sinauer, 2016

Kardong KV, **Vertebrates. Comparative Anatomy, Function, Evolution**, 7, McGraw-Hill, 2015

Complementary Bibliography

Recommendations