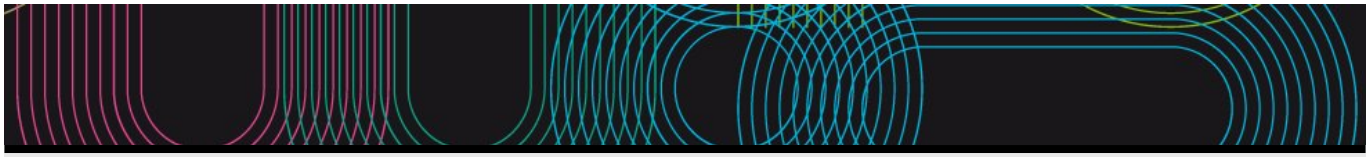

IDENTIFYING DATA				
Zoology 2: Arthropod invertebrates and chordates				
Subject	Zoology 2: Arthropod invertebrates and chordates			
Code	V02G031V01210			
Study programme	Grado en Biología			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	2nd	2nd
Teaching language	#EnglishFriendly Spanish 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			
E-mail	mbriones@uvigo.es smato@uvigo.es			
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			
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 dessign 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 exploitating 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 Suphylum 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 Chondrichtyes Class Actinopterygii Class Sarcopteriygii
IV. Phylum Chordata: Craneata	Subphylum Vertebrata (Tetrapod Vertebrates) Class Amphybia 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	Theorical 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 questionaires 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 sylllabus
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 vritually (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 continous 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