



IDENTIFYING DATA

Zoology II: Arthropods invertebrates and chordates

Subject	Zoology II: Arthropods invertebrates and chordates			
Code	V02G030V01405			
Study programme	(*)Grao en Bioloxía			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Mandatory	2nd	2nd
Teaching language	Spanish			
Department				
Coordinator	Iglesias Briones, Maria Jesús			
Lecturers	Iglesias Briones, Maria Jesús Juan Ovejero, Raquel Kim , Sin Yeon Noguera Amoros, Jose Carlos Palanca Soler, Antonio			
E-mail	mbriones@uvigo.es			
Web				
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.			

Competencies

Code		Typology
CB1	Students should prove understanding and knowledge in this study field that starts in the Secondary Education and with a level that, even though it is supported in advanced books, also includes some aspects that involve knowledge from the vanguard of the study field.	• know
CB2	Students should know how to apply their knowledge to their work or vocation in a professional way. They also should have the competences that are usually proved through the elaboration and defence of arguments and the resolution of problems within their study field.	• Know How
CB3	Students should prove ability for information-gathering and interpret important data (usually within their study field) to judge relevant social, scientific or ethical topics.	• Know How
CB4	Students should able to communicate information, ideas, issues and solutions to all audiences (specialist and unskilled audience).	• Know How
CG2	Ability of reading and analyzing scientific papers and having critical assessment skills to understand data collection, deducing the main idea from the least relevant ones and basing on the corresponding conclusions.	• Know How
CG3	Acquisition of general knowledge about the basic subjects of biology, both at theory and experimental level, without dismissing a higher specialization in subjects that are oriented to a concrete professional area.	• know
CG4	Ability in handling experimental tools, both scientific and computer technology equipment that support the search for solutions to problems related to the basic knowledge of biology and with those of a concrete labour context.	• Know How
CG5	Understanding of the levels of organization of living beings from a structural (molecular, cellular and organic) and functional point of view by observing their relations with the environment and other organisms, as well as their appearances in situations of environmental alteration.	• know
CG7	Collection of information about issues of biologic interest, analysis and emission of critical opinions and reason them including the reflection about social and/or ethical aspects related to the issue.	• Know How
CG10	Development of analytic and abstraction skills, the intuition and the logical and rigorous thought through the study of biology and its uses.	• Know How
CG11	Ability to communicate in detail and clearly: knowledge, methodology, ideas, issues and solutions to all audiences (not only qualified but unskilled in Biology).	• Know How

CG12	Ability to identify their own educational necessities in the biology field and in concrete labour areas and to organize their learning with a high grade of autonomy in any context.	• Know How
CE1	Obtaining, managing, preserving, describing and identifying current biological organisms and fossils.	• Know How
CE2	Recognizing different levels of Living systems organization. Performing phylogenetic analysis and identifying evidence of evolution.	• Know How
CE9	Analysing and interpreting the behaviour of living beings	• Know How
CE10	Analysing and assessing the adaptation of living beings to the environment.	• Know How
CE11	Sampling, characterizing, managing, preserving and restoring Populations, Communities and Ecosystems.	• Know How
CE12	Cataloguing, mapping, assessing, preserving, restoring and managing natural and biological resources.	• Know How
CE23	Developing, managing and using biological control techniques.	• Know How
CE24	Designing biological process models.	• Know How
CE31	Knowing and handling technical and scientific apparatus.	• Know How
CE32	Knowing and handling basic or specific key concepts and terminology	• know
CE33	Understanding the social projection of Biology.	• know
CT1	Development of capacity of analysis and synthesis	• Know How
CT2	Acquisition of the organization and planning capacity for tasks and time	• Know How
CT3	Development of oral and writing communication abilities	• Know How
CT4	Acquisition of foreign language knowledge related to the study field	• know
CT6	Research and interpreting of information from different sources	• know
CT7	Resolution of issues and decision making in an effective way	• Know How
CT8	Development of the ability of independent learning	• Know How
CT9	Ability to work in collaboration or creating groups with an interdisciplinary character	• Know How
CT10	Development of the critical thinking	• know
CT11	Adquisition of an ethical agreement with the society and the profession	• Know be
CT12	Respectful behaviour to diversity and multiculturalism	• Know be
CT13	Sensitivity for environmental issues	• Know be
CT14	Adquisition of abilities in the interpersonal relationships	• Know How
CT15	Development of creativity, initiative and entrepreneurial spirit	• Know How
CT17	Development of the self-criticism ability	• know

Learning outcomes

Learning outcomes	Competences
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.	CB1 CB2 CB3 CB4 CG5 CE1 CE2 CE32 CT1 CT6 CT10
To know the biodiversity and the organisms' abilities to adapt to their environment: species identification (use of dichotomous keys) and analysis of animal behaviour	CB1 CB2 CB3 CB4 CG2 CG4 CG5 CE1 CE9 CE10 CE11 CE31 CT6 CT7 CT12 CT13

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

CB1
CB2
CB3
CB4
CG2
CG5
CE1
CE10
CT1
CT6
CT9
CT10

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.

CB1
CB2
CB3
CB4
CG7
CE1
CE11
CE12
CE23
CE24
CE31
CT1
CT2
CT6
CT7
CT8
CT9
CT10
CT11
CT13
CT15

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

CB1
CB2
CB3
CB4
CG2
CG3
CG4
CG7
CG12
CE9
CE10
CE24
CT2
CT9
CT10
CT11
CT13
CT15

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.	CB1 CB2 CB3 CB4 CG2 CG3 CG7 CG10 CG11 CE31 CE32 CE33 CT1 CT3 CT4 CT6 CT7 CT8 CT9 CT10 CT11 CT12 CT13 CT14 CT15 CT17
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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 Sarcopterygii
IV. Phylum Chordata: Craneata	Subphylum Vertebrata (Tetrapod Vertebrates) Class Amphybia Class non Avian Reptiles Class Aves Class Mammals
PRACTICE PROGRAMME	Practice I. Morphological study of Arthropods I. External morphology of different groups. Practice II. Morphological study of Arthropods II. Internal morphology of a model arthropod. Practice III. Morphological study of Vertebrates I. External and internal morphology of a teleostean fish. Practice IV. Morphological study of Vertebrates II. Diversity of Amphibian and Reptiles. Practice V. Morphological study of Vertebrates III. Diversity of Birds and Mammals. Practice VI. Field trip. Observation in situ of different groups of arthropods and chordates.

Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	28	42	70
Laboratory practises	15	30	45
Case studies / analysis of situations	0	16	16
Seminars	3	0	3
Short answer tests	2	14	16

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

Methodologies

	Description
Master Session	Theoretical contents related by the professor in the classroom. "Teaching starts in the classroom and ends in the books".
Laboratory practises	Practical activities at the laboratory which complement the topics addressed during the theoretical lessons.
Case studies / analysis of situations	Resolution of practical cases and questionnaires using the online TEMA platform. These are intended to help in retaining concepts but above all to acquire the transversal skills included in the syllabus.
Seminars	They can be used to solve any problems arisen during the course. Execution of complementary activities of the theoretical-practical aspects of the course. The competences of foreign language (English) will be worked out.

Personalized attention

Methodologies	Description
Seminars	The tutorials for groups of several students do not allow a personalized follow-up but they are a good mechanism to consult any doubts and enable the teacher to share their 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. In addition, personalized tutorials (Tuesday and Thursday 10:00-13:00) will also be used to monitor the development of the subject and resolution of any questions that could arise.

Assessment

	Description	Qualification	Evaluated	Competences
Laboratory practises	Attending the practical lessons and performing the written examination of the practical contents. The student attitude and the active participation in the laboratory work would be positively evaluated.	20		CB1 CB2 CB3 CB4 CG2 CG4 CG5 CE1 CE2 CE11 CE31

Seminars	Assistance and resolution of a case study. The attitude and active participation in the debates is especially valued.	10	CB1 CB2 CB3 CB4 CG7 CG10 CG11 CE31 CE32 CE33 CT1 CT2 CT3 CT4 CT6 CT7 CT8 CT9 CT10 CT11 CT14 CT17
Case studies / analysis of situations	Activities posted to the onlineTEMA platform: resolution of theoretical-practical exercises related to each of the thematic units. They are intended to evaluate the transversal competences acquired by the students. Each of them allows the teacher to evaluate the student efforts during the course. Each of the activities will be evaluated on a scale from 1 to 10 that will then be averaged to obtain the final score.	10	CB1 CB2 CB3 CB4 CG12 CE9 CE23 CE24 CE33 CT1 CT2 CT3 CT4 CT6 CT7 CT8 CT10 CT11 CT12 CT13 CT15

Short answer tests	Written exam where the student has to answer several questions related to the theoretical aspects of the subject. The aim is to evaluate the extent of the acquisition of the contents of the course.	60	CB1 CB2 CB3 CB4 CG2 CG3 CG5 CG11 CE2 CE9 CE10 CE12 CE32 CE33
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Other comments on the Evaluation

The written exams dealing with the theoretical aspects of the course will be performed on the official dates (June and July) published in the examination calendar which can be found on the faculty website:
http://bioloxia.uvigo.es/docs/docencia/examenes/exames_grado_2017-18.pdf

The written tests about the practical aspects will be performed at the end of each practical class. Those marks obtained during the continuous evaluation (i.e. attending the seminars and practical lessons, on-line activities and questionnaires in TEMA) can be conserved until the second and extraordinary examination dates of the current academic year and therefore, they CANNOT be re-taken; in contrast, the written exams could be taken again on each of the official examination dates established in the academic calendar.

The final mark is calculated by the addition of the parts (after calculating the percentages assigned) **as long as each part of the total evaluation (theory, practice, seminars and activities) had been passed (minimum 5.0).**

The students are considered "absent" if they do not attend any of the written exams occurring on the two official calls (first and second call of the current academic year).

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, ÍAnson H & Eisenhour DJ, Integrated Principles of Zoology, 16, McGraw-Hill,
 Brusca RC, Moore W and Shuster SM, Invertebrates, 3, Sinauer,
 Kardong KV, Vertebrates. Comparative Anatomy, Function, Evolution, 7, McGraw-Hill,

Complementary Bibliography

Recommendations

Subjects that continue the syllabus

Zoology I: Invertebrates in arthropods/V02G030V01305

Subjects that are recommended to be taken simultaneously

Animal and plant histology and cytology II/V02G030V01403

Genetics I/V02G030V01404

Subjects that it is recommended to have taken before

Biology: Basic field and remote sensing techniques/V02G030V01202

Zoology I: Invertebrates in arthropods/V02G030V01305

Other comments

In the SET (European supplement to the degree) the language in which the subject is taught will be specified.