

Approval date: 25/06/2024

COURSE GUIDE

Zoology (2001125)

Grado (Bachelor's Degree)	Grado en Biología		Branch	Sciences			
Module	Zoología		Subject	Zoología			
Year of study	2º	Semester	1 y 2º	ECTS Credits	12	Course type	Compulsory course

PREREQUISITES AND RECOMMENDATIONS

None

BRIEF DESCRIPTION OF COURSE CONTENT (According to the programme's verification report)

- Introduction to the science of Zoology
- Taxonomy and Systematics
- Reproduction and Development
- Architectural pattern and basic functions of animals
- Animal Diversity

SKILLS

GENERAL SKILLS

- CG01 - Organisational and planning skills
- CG02 - Teamwork
- CG03 - Applying knowledge to problem solving
- CG04 - Capacity for analysis and synthesis
- CG05 - Knowledge of a foreign language
- CG06 - Critical reasoning
- CG07 - Informatic knowledge regarding the field scope
- CG08 - Self-directed learning for continuous professional development
- CG09 - Oral and written communication in the mother tongue
- CG10 - Decision making
- CG12 - Sensitivity to social and environmental issues
- CG13 - Skills in interpersonal relations
- CG14 - Quality motivation
- CG17 - Information management skills
- CG19 - Ethical commitment



SUBJECT-SPECIFIC SKILLS

- CE01 - Recognise different levels of organisation in the living system.
- CE05 - Identify organisms
- CE07 - Catalogue, evaluate and manage natural resources
- CE08 - Realizar análisis filogenéticos
- CE09 - Identifying and using bioindicators
- CE15 - Identificar y analizar material de origen biológico y sus anomalías
- CE18 - Obtain, handle, conserve and observe specimens
- CE24 - Analizar e interpretar el comportamiento de los seres vivos
- CE27 - Diagnose and solve environmental problems
- CE28 - Sample, characterise and manage populations and communities
- CE30 - Develop and apply biocontrol techniques
- CE42 - Conocer el concepto y origen de la vida
- CE43 - Knowing the types and levels of organisation
- CE45 - Saber los mecanismos y modelos evolutivos
- CE46 - Conocer el registro fósil
- CE48 - Conocer la diversidad animal
- CE51 - Saber sistemática y filogenia
- CE52 - Saber biogeografía
- CE61 - Conocer la estructura y función de los tejidos, órganos y sistemas animales y vegetales
- CE62 - Conocer la anatomía y morfología animal y vegetal
- CE63 - Conocer la biología del desarrollo
- CE64 - Entender la regulación e integración de las funciones animales
- CE68 - Understand functional adaptations to the environment
- CE69 - Understand biological cycles
- CE72 - Understanding Interactions between species

LEARNING OUTCOMES

Students will know/understand:

Animal diversity as the result of the evolutionary process.

Common animal observation techniques, both in the field and in the lab.

Students will be able to:

Identify the main animal groups, and to recognize and name some Iberian and European taxa.

Students will learn about internal and external anatomy, architectural patterns, basic functions and general biology of the main animal groups.

Understand and interpret animal phylogenies, as well as knowing the main hypotheses regarding evolutionary relationships between animal groups.

PLANNED LEARNING ACTIVITIES

THEORY SYLLABUS

Section 1. Basic Concepts

Unit 1. Introduction. (1 hour)

Main content of the course: organization and references. Definition of animal, discussion of the concepts of protists and protozoans. Historical development of Zoology. Zoology topics and related disciplines.



Unit 2. Basic evolutionary theory. (1 hour)

Historical development of evolutionary theories. Natural selection and other evolutionary processes. Species concept and main speciation models.

Unit 3. Animal distribution. (1,5 hours)

Basic concepts on geographical distribution. Ecological and historical Zoogeography. Zoogeographical realms. Dispersal and vicariance. Mechanisms of dispersal. Continental drift. Glacial cycles.

Unit 4. Animal Taxonomy and Systematics. (2,5 hours)

Theories of taxonomy and the classification of animals. Concept of homology and criteria to recognize it. Basis of phylogenetic inference. Rules of zoological nomenclature and classification.

Unit 5. Animal reproduction and development. (2 hours)

Sexual and asexual reproduction. Egg structure and types. Cleavage, embryonic and post-embryonic development. Larvae and metamorphosis.

Unit 6. Architectural patterns and basic functions of animals. (2,5 hours)

Hierarchical organization of animal complexity. Animal body plans. Symmetry. Cephalization. Metamerism. Body cavities: coelom and pseudocoelom. Basic functions and related structures.

Unit 7. Origin and evolutionary history of animals. (1 hour)

Animal origins and radiation. Phylogeny and classification of animals.

Section 2. Animal diversity**Unit 8. Poriferans. (1 hour)**

Poriferans (sponges): general body plan, biology and classification. Porifera cell types. Skeletal framework. Form and function.

Unit 9. Cnidarians. (2 hours)

Cnidaria: general body plan. Dimorphism, polymorphism and life cycles. Cnidocytes. Phylogeny, classification and biology of Hydrozoa, Scyphozoa, Cubozoa and Anthozoa. Coral reefs.

Unit 10. Ctenophores and Placozoans. (0,5 hours)

General body plan and biology of Ctenophores. Description and classification of Placozoans. Basal animal phylogeny.

Lophotrochozoans**Unit 11. Platyhelminthes. (2 hours)**

Bilateral and acoelomate body plan. Platyhelminthes: general characteristics. Classification. Body plan and biology of Turbellaria. Adaptations related to parasitism. Body plan and biology of Monogenea, Trematoda and Cestoda.

Unit 12. Molluscs. (4 hours)

Molluscs: general characters. Mantle and shell. The radula. Classification and phylogeny. General body plan and biology of Solenogastres, Caudofoveata, Polyplacophora, Monoplacophora and Scaphopoda. Body plan, general characteristics and biology of Bivalvia, Gastropoda and Cephalopoda.

Unit 13. Annelids. (2,5 hours)

Annelids: general characters. Coelom and metamerism in annelids. Classification. Body plan and biology of Polychaeta, Oligochaeta and Hirudinida. Phylogeny. Brief description of Echiuridae and Sipuncula.

Unit 14. Lophotrochozoan phylla. (1 hour)

Phylum Rotifera: general characters, life cycles and dormant eggs. Brief description of Entoprocta, Ectoprocta, Cycliophora, Nemertea, Micrognathozoa, Gastrotricha, Mesozoa, Gnathostomulida, Phoronida and Brachiopoda.

Ecdysozoans**Unit 15. Nematodes and allied ecdysozoans. (2 hours)**

Nematodes and allied ecdysozoans. Phylum Nematoda: biological importance and adaptations related to parasitism. Brief description of phylla: Nematomorpha, Loricifera, Kinorhyncha, Priapulida, Chaetognatha, Onychophora and Tardigrada.

Unit 16. Introduction to Arthropods. (4 hours)

Phylum Arthropoda. General ideas and taxonomic definition of arthropods. Arthropoda body plan and the colonization of terrestrial habitats: implications and consequences of



morphological design. Metamerism and tagmatization. Arthropod appendages. Cuticle and molting. Anatomy. Classification.

Unit 17. Chelicerates and Myriapods. (2,5 hours)

General characters, body plan and biology of Chelicerata. Classification and phylogeny of Chelicerata. General characters, body plan, biology, classification and phylogeny of Myriapoda.

Unit 18. Crustaceans. (2 hours)

General characters, body plan, biology, classification and phylogeny of Crustacea.

Unit 19. Hexapods. (4 hours)

General characters, body plan, biology, classification and phylogeny of Hexapoda. The evolutionary success of insects.

Deuterostomes

Unit 20. Echinoderms and Hemichordates. (2 hours)

General characters of Deuterostomes. General characters, classification and the secondary pentaradial symmetry of Echinodermata. Body plan, biology and phylogeny of Crinoidea, Asteroidea, Ophiuroidea, Echinoidea and Holothuroidea. Phylum Hemichordata: generalities and phylogenetic relationships.

Unit 21. Introduction to Chordates. (2 hours)

General characters and body plan, origin and classification of Chordata. Body plan, biology and classification of Urochordata and Cephalochordata.

Unit 22. Introduction to Vertebrates. (3 hours)

General characters and body plan of Vertebrata. Evolutionary history and classification.

Unit 23. Non-tetrapod aquatic vertebrates: Agnathans, Chondrichthyes and Osteichthyes. (2,5 hours)

Body plan, biology, classification and phylogeny of Myxini and Petromyzontida. Evolution of the jaw and paired appendages. General characters, body plan, classification and phylogeny of Chondrichthyes and Osteichthyes.

Unit 24. Amphibians. (3 hours)

Amphibians, the transition from water to land I: tetrapod limbs. Generalities, body plan, biology, classification and phylogeny of Amphibia.

Unit 25. Amniotes. (3 hours)

The transition from water to land II: the amniotic egg. General characters, body plan, biology, classification and phylogeny of nonavian Reptiles.

Unit 26. Birds. (3 hours)

General characters, body plan, biology, classification and phylogeny of Aves. Adaptations of birds to flight.

Unit 27. Mammals. (2,5 hours)

General characters, body plan, biology, classification and phylogeny of Mammalia. Development and implications of viviparity in mammals.

Seminars

Students will be offered a list of subjects to choose from to prepare a seminar under the lecturers' supervision. This seminar must be presented to the rest of students in class.

PRACTICAL SYLLABUS

A) Laboratory sessions (2 hours each)

Session 1. Poriferans and Cnidarians. Sponges: Observation of the morphology of collection specimens. Observation of skeletal spicules. Cnidarians: Observation of specimens belonging to Hydrozoa, Scyphozoa and Anthozoa, paying attention to different ways of living (floating, free-swimming, sessile forms), colonial growing types and skeleton. Observation, whenever possible, of live specimens in a small marine aquarium installed in the Zoology lab.

Session 2. Platyhelminthes, Nematodes, Nematomorphs, Rotifers and Annelids. Platyhelminthes. Observation of fresh specimens and microscope slides of Turbellaria, Trematoda and Cestoda, looking at different morphologies and identifying internal structures.



Observation of specimens of Nematodes, Nematomorphs and Rotifers. Annelids: observation of external traits in collection specimens of Errantia, Sedentaria, Hirudinida and Oligochaeta.

Session 3. Molluscs, I: Polyplacophora, Scaphopoda and Bivalvia. Observation of external traits in collection specimens of Polyplacophora, Scaphopoda and Bivalvia. Observation of shapes and traits of bivalve's shells, understanding how those traits relate to the lifestyle of the different specimens.

Session 4. Molluscs, II: Gastropoda and Cephalopoda. Observation of external traits in collection specimens of Gastropoda and Cephalopoda. Analysis of the different parts of the Gastropod's shell that are used in taxonomy and can inform about their lifestyle. Analysis of the shells and lifestyle of cephalopods.

Session 5. Arthropods, I: Chelicerates and Myriapods. Observation of external traits in collection specimens of Chelicerates (Xiphosurida, Scorpiones, Pseudoscorpionida, Solpugida, Opiliones, Acari, Araneae and Pycnogonida) and Myriapods (Chilopoda and Diplopoda). Discussion of feeding and lifestyle habits of chelicerates and myriapods based on their morphology.

Session 6. Arthropods, II: Crustaceans. Observation of external traits in Notostraca, Anostraca, Cladocera, Conchostraca, Ostracoda, Copepoda, Thecostraca, Stomatopoda, Amphipoda, Isopoda and Decapoda). Discussion of feeding and lifestyle habits of crustaceans based on their morphology. Observation, whenever possible, of live specimens of groups typically dwelling in temporary ponds. Students will also have the opportunity to follow the life cycle of individuals of these groups by flooding small aquariums kept in the lab with dormant eggs of these groups; this way the students may follow egg hatching, larvae and adults during the practical sessions.

Session 7. Arthropods, III: Morphology and life cycle of Hexapods. Observation of external traits, mouthparts, appendages, wing morphology and life cycle in collection specimens of apterygota (Collembola, Thysanura), Exopterygota (Ephemeroptera, Odonata, Plecoptera, Embioptera, Orthoptera, Phasmida, Blattodea, Mantodea, Dermaptera, Psocodea and Hemiptera) and Endopterygota (Neuroptera, Raphidioptera, Megaloptera, Mecoptera, Trichoptera, Lepidoptera, Hymenoptera, Siphonaptera, Coleoptera and Diptera) hexapods.

Session 8. Arthropods, IV: Hexapods diversity (I). Observation of drawings, diagrams and collection specimens of apterygota and exopterygota, paying attention to the morphological traits that allow group identification, as well as inferring life cycle and habitat. Observation, whenever possible, of live specimens of exopterygota with aquatic nymphs (Ephemeroptera, Odonata) in the lab's aquarium, looking at the morphological changes occurring through metamorphosis.

Session 9. Arthropods, V: Hexapods diversity (II). Observation of drawings, diagrams and collection specimens of endopterygota, learning how to identify the different orders using morphological traits, as well as inferring life cycle and habitat. Observation, whenever possible, of live specimens of endopterygota with aquatic larvae or adults (Coleoptera, Trichoptera) in the lab's aquarium, looking at the morphological changes occurring through metamorphosis. Students will also use identification guides and keys.

Session 10. Echinoderms and Chordates I (Urochordata and Cephalochordata). Observation of external traits in collection specimens of Crinoidea, Asteroidea, Ophiuroidea, Holothuroidea and Echinoidea. Inference of lifestyle and feeding habits of echinoderms based on morphology. Observation of external traits in collection specimens of Ascidiacea, Thaliacea and Cephalochordata.

Session 11. Chordates II: Agnathans, Chondrichthyes and Osteichthyes. Observation of external traits in collection specimens of Petromyzontiformes, Chondrichthyes and Osteichthyes. Use of dichotomous keys to identify several species of chondrichthyes and osteichthyes, paying attention to the relevant traits that allow the identification of species.

Session 12. Chordates III: Amphibians and Reptiles. Observation of external characters in collection specimens of Iberian amphibians (Caudata and Anura) and reptiles, emphasizing those traits of taxonomic interest. Use of dichotomous keys to identify species.

Session 13. Chordates IV: Aves. Observation of external traits and identification of Iberian bird species using collection specimens. Discussion of lifestyle and feeding habits of the species based on their morphology. Observation of different types of feathers and skeletal traits that are



considered adaptations to flight. Observation of indirect clues such as nests and pellets, and study of habitats and songs of Iberian species. Use of identification guides and keys.

Session 14. Chordates V: Mammals. Observation of external traits and identification of Iberian mammals using collection specimens (skeletons and furs). Observation of adaptations of legs to particular habitats and teeth to different types of food. Observation of antlers, horns, footprint moulds and excrements. Habitats and vocalizations of mammals. Use of keys to identify skulls. **PLEASE BE AWARE that during practical sessions it is compulsory to use lab coat, closed shoes and in some cases gloves and goggles.**

B) FIELD TRIP (three days long)

Observation of animals in the wild, mainly birds and other vertebrates; during the field trip students will be encouraged to pay special attention to animal behaviour, footprints and tracks. Setting up pitfall traps to collect and identify terrestrial invertebrates. Collecting and identifying marine invertebrates.

RECOMMENDED READING

ESSENTIAL READING

Hickman, C.P.Jr.; Keen, S.L.; Eisenhour, D.J.; Larson, A. y l'Anson, H. (2017). Integrated Principles of Zoology. 17ª edición. McGraw-Hill Education. New York.
Vargas, P. y Zardoya, R. (2012). El árbol de la vida: sistemática y evolución de los seres vivos. CSIC. Madrid.

COMPLEMENTARY READING

Brusca, R.C.; Moore, W. y Shuster, S.M. (2016). Invertebrates. Third Edition. Sinauer Associates. Sunderland, Massachusetts.
Gullan, P.J. y Cranston, P.S. (2014). The Insects. An outline of Entomology. Blackwell Publishing. Oxford.
Linzey, D.W. (2012). Vertebrate Biology. 2nd edition. The Johns Hopkins University Press, Baltimore.
Nielsen, C. (2012) Animal evolution. Interrelationships of the living phyla. Third edition. Oxford University Press, Oxford.
Pough, F.H. & Janis, C.M. (2019). Vertebrate Life. Tenth edition. Pearson Education Inc., San Francisco.
Ruppert, E.E.; Fox, R.S. & Barnes, R.D. (2004). Invertebrate Zoology. A functional Evolutionary Approach. Brooks/Cole, Belmont.
Telford, M.J. & Littlewood, D.T.J. (2008). Animal Evolution. Genomes, Fossils, and Trees. Oxford University Press. Oxford

RECOMMENDED LEARNING RESOURCES/TOOLS

FIELD GUIDES:

Arnold, E.N. y J.A. Burton. (1982). Guía de campo de los reptiles y anfibios de España y de Europa. Ed. Omega. Barcelona.
Askew R.R. 1988. The Dragonflies of Europe. Harley Books (B.H. y A. Harley Ltd.). England.
Bang, P. y Dahlström, P. (1992). Huellas y señales de los animales de Europa. Ed. Omega. Barcelona.
Barbadillo, L.J.; J.I. Lacomba; V. Pérez-Mellado; V. Sancho y L.F. López-Jurado. (1999). Anfibios y



reptiles de la Península Ibérica, Baleares y Canarias. Ed. Planeta. Barcelona.

Bauchat, M.L. y A. Pras. (1987). Peces de mar de España y Europa. Omega. Barcelona.

Burton, M. (1985). Mamíferos de España y Europa. Omega. Barcelona.

Castells, A. y M. Mayo. (1993). Guía de los mamíferos en libertad de España y Portugal. Ed. Pirámide. Madrid.

Chinery, M. (1997). Guía de campo de los insectos de España y Europa. Omega. Barcelona.

De Juana, E. y Varela, J.M. (2016). Guía de las aves de España. Península, Baleares y Canarias. Lynx Edicions. Barcelona.

Jones, D. (1985). Guía de campo de los arácnidos de España y Europa. Omega. Barcelona.

Ocaña-Martín, A.; L. Sánchez-Tocino; S. López-González y J.F. Viciana-Martín. (2000). Guía submarina de Invertebrados no Artrópodos. 2ª Ed. Ed. Comares. Granada.

Olsen, L-H. (2012). Animales & Huellas. Omega. Barcelona.

Pleguezuelos, J.M. (1997). Distribución y Biogeografía de los Anfibios y Reptiles en España y Portugal. Ed. Universidad de Granada y Asociación Herpetológica Española, Granada

Purroy, F.J. y Varela, J.M. (2016). Guía de los mamíferos de España. Península, Baleares y Canarias. Lynx Edicions. Barcelona.

Salvador, A. y García París, M. (2001). Anfibios españoles. Identificación, historia natural y distribución. Canseco Editores S.L. Talavera de la Reina.

Salvador A. y Pleguezuelos J.M. (2014). Guía de Reptiles de España. Canseco Editores S.L. Talavera de la Reina.

Svensson, L. 2010. Guía de aves: España, Europa y región mediterránea. Ed. Omega. Barcelona.

Tola, J. e Infiesta, E. 2002. Peces continentales de la Península Ibérica. Ediciones Jaguar. Madrid. Serie FAUNA IBÉRICA. Consejo Superior de Investigaciones Científicas. Madrid. Desde 1990 (volumen 0) hasta 2022 (volumen 47)

POPULAR SCIENCE:

Arsuaga, J.L. y Martínez, I. (1998) La especie elegida. Ediciones Temas de Hoy, Madrid.

Ayala, F.J. (1999) La teoría de la evolución. De Darwin a los últimos avances de la genética. Ediciones Temas de Hoy, Madrid.

Barrie, D. (2020). Los viajes más increíbles. Crítica, Barcelona.

Bellés, X. (1998) Supervivientes de la biodiversidad. Rubes Editorial, Barcelona.

Brusatte, S. (2019). Auge y caída de los Dinosaurios. La nueva historia de un mundo perdido. Debate. Madrid.

Brusatte, S. (2024). Auge y reinado de los mamíferos: Una nueva historia. Desde la sombra de los dinosaurios hasta nosotros. Debate. Madrid.

Dawkins, R. & Wong, Y. (2016). The ancestor's tale. Weidenfeld & Nicholson. UK.

Dawkins, R. (1986) The blind watchmaker. W.W. Norton & Company. New York.

Dawkins, R. (1976) The selfish gene. Oxford University Press.

Delibes de Castro, M. (2001) Vida. La Naturaleza en peligro. Ediciones Temas de Hoy, Madrid.

Gould, S.J. (1980) The Panda's thumb. W.W. Norton & Company. New York.

Gould, S.J. (1987) La sonrisa del flamenco. Reflexiones sobre Historia Natural. Hermann Blume, Madrid.

Gould, S.J. (1991) Wonderful life: The Burgess Shale and the nature of history. W.W. Norton & Company. New York.

Gould, S.J. (1993) "Brontosaurus" y la nalga del ministro. Crítica, Barcelona.

Gould, S.J. (1994) Ocho cerditos. Crítica, Barcelona.

Hölldobler, B. Y Wilson, E.O. 1994. Journey to the ants. Ed. Belknap Press of Harvard University, Harvard.

Martínez, J.G. (2021). La astucia de las aves. Parasitismo, reproducción y las estrategias de supervivencia más creativas de la Naturaleza. Editorial Guadalmazán. Córdoba.

Maynard-Smith, J. (1984) La teoría de la evolución. Hermann Blume, Madrid.

Mayr, E. (1992) Una larga controversia: Darwin y el darwinismo. Crítica, Barcelona.

Mayr, E. (1998) Así es la Biología. Debate, Madrid.

Sanz, J.L. (1999) Los dinosaurios voladores. Historia evolutiva de las aves primitivas. Libertarias, Madrid.



Shubin, N. (2008) Your inner fish: a journey into the 3.5 billion year history of human body. Pantheon Books. New York.

Timbergen, N. (1986) Naturalistas curiosos. Salvat Editores, S.A., Barcelona.

Weismann, E. (1986) Los rituales amorosos. Salvat Editores, S.A., Barcelona.

Wilson, E.O. (1992). The diversity of life. Penguin Books. London.

SUGGESTED LINKS

Museo virtual de Zoología: <https://ccz.ugr.es/>

El litoral de Granada: <https://litoraldegranada.ugr.es/>

Fauna Europaea Web Service (2016): <https://fauna-eu.org/>

MarBEF (2004). European Marine Biodiversity Research Sites:

<http://www.marbef.org/data/sites.php>

Maddison, D. R. and K.-S. Schulz (eds.) 2007. The Tree of Life Web Project: <http://tolweb.org>

Sociedad española de Biología evolutiva: <http://sesbe.org/>

Encyclopedia of Life: <https://eol.org/>

Global Biodiversity Information Facility: <https://www.gbif.org/>

WoRMS-World Register of Marine Species: <http://www.marinespecies.org/>

AmphibiaWeb: <https://amphibiaweb.org/>

The Reptile Database: <http://www.reptile-database.org/>

BirdLife International: <http://www.birdlife.org/>

Enciclopedia de las Aves de España SEO/Birdlife: <https://www.seo.org/listado-aves-2/>

Fauna Ibérica. <http://www.fauna-iberica.mncn.csic.es/>

FishBase: <https://www.fishbase.se/search.php>

IUCN: <https://www.iucn.org/>

IUCN Red List of threatened species. <https://www.iucnredlist.org/>

Mammal Diversity Database. <https://mammaldiversity.org>

Revista IDE@ SEA - Sea-entomologia.org. <http://sea-entomologia.org/IDE@/>

"Enciclopedia Virtual de los Vertebrados Españoles": <http://www.vertebradosibericos.org/>

Birds of the World: <https://birdsoftheworld.org>

TEACHING METHODS

- MD01 - Lección magistral/expositiva
- MD02 - Sesiones de discusión y debate
- MD03 - Resolución de problemas y estudio de casos prácticos
- MD04 - Prácticas de laboratorio y/o clínicas y/o talleres de habilidades
- MD05 - Prácticas de campo
- MD07 - Seminarios
- MD09 - Análisis de fuentes y documentos
- MD10 - Realización de trabajos en grupo
- MD11 - Realización de trabajos individuales

ASSESSMENT METHODS (Instruments, criteria and percentages)

ORDINARY EXAMINATION DIET

ORDINARY CALL: CONTINUOUS ASSESMENT

The assessment of the level of acquisition of general and specific competences by the students will be carried out in a continuous way through the academic year using:

- **Evaluation of the contents of the theory syllabus through exams**

Percentage of final grade: 55%.



It is compulsory to obtain at least 5 (out of 10) points in the different exams to calculate their weighed mean.

- **Evaluation of the contents of the practical sessions through exams**

Percentage of final grade: 25%.

Practical exams will have two parts, that must be passed with 3,5 (out of 10) points to calculate their mean.

It is compulsory to obtain at least 5 (out of 10) points in the different exams to calculate their weighed mean.

- **Seminars: essay and presentation**

Working out an essay, its presentation and defense in class.

Percentage of final grade: 10%.

- **Attendance, attitude and participation of students in teaching activities, elaboration of a field notebook**

Percentage of final grade: 10%.

EXTRAORDINARY EXAMINATION DIET

The extraordinary call will consist in two different exams, one for the theory contents (70% of final grade) and one practical exam (30% of final grade). It is needed to obtain 5 or more points (out of 10) in both exams to calculate their weighed mean.

Nonetheless, those students who had passed either theory or practical exams in the ordinary call, can keep this grade and take in the extraordinary call only the exam that did not pass in the ordinary one. Percentages of theory and practical applied will be the same in this case.

SINGLE FINAL ASSESSMENT (evaluación única final)

Students can be assessed for their final grade through a unique exam (Single final assessment) following the evaluation norms of University of Granada.

Such an assessment will consist in an exam of the theory content (70% of final grade) and an exam of the practical content (30% of final grade) of the course. It is compulsory to obtain 5 or more points (out of 10) in both of them to calculate their weighed mean.

ADDITIONAL INFORMATION

Teaching activities schedule (theory and practical sessions) can be found in :

<http://grados.ugr.es/biologia/pages/infoacademica/horarios>

Exams schedule for ordinary and extraordinary calls can be found in:

<http://grados.ugr.es/biologia/pages/infoacademica/convocatorias>

Información de interés para estudiantado con discapacidad y/o Necesidades Específicas de Apoyo Educativo (NEAE): [Gestión de servicios y apoyos \(https://ve.ugr.es/servicios/atencion-social/estudiantes-con-discapacidad\)](https://ve.ugr.es/servicios/atencion-social/estudiantes-con-discapacidad).

