

**COURSE DATA****Data Subject**

Code	44300
Name	Morphology and animal diversity
Cycle	Master's degree
ECTS Credits	3.0
Academic year	2023 - 2024

Study (s)

Degree	Center	Acad. year	Period
2200 - Master's Degree in Applied Palaeontology	Faculty of Biological Sciences	1	First term

Subject-matter

Degree	Subject-matter	Character
2200 - Master's Degree in Applied Palaeontology	3 - Advanced scientific training	Optional

Coordination

Name	Department
RAGA ESTEVE, JUAN ANTONIO	355 - Zoology

SUMMARY

The course "Morphology and animal diversity" is included within the group of optional subjects of the Masters in Applied Paleontology has 3 ECTS taught in the first semester of the academic year. The course is structured around two thematic content blocks that together constitute an introduction to the discipline of zoology.

The first block includes the broader aspects of this discipline: current hypotheses about the origin of metazoans. It is also necessary to deepen and broaden the animal aspects of development and architecture, and life cycles. Thus, the stage is set for submitting animal classification, aspect that will end this block of content.

In the next block the animal biodiversity, where the study of the most representative body edges of each plan is addressed in this regard is not all edges is treated, but only the most significant of the fossil record: Cnidarians, Mollusks, Arthropods, Ectoprocta, brachiopods,



echinoderms and vertebrates.

The contents and proposed activities will provide students of the Master, which specify the necessary basic knowledge to address other subjects.

The proposed work will take place the subject as a cross-type activity of the seminar.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

Prerequisites or previous recommendations not necessary.

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

2200 - Master's Degree in Applied Palaeontology

- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.
- Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.
- Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.
- Students should demonstrate self-directed learning skills for continued academic growth.
- Be able to access to information tools in other areas of knowledge and use them properly.
- Be able to apply the research experience acquired to professional practice both in private companies and in public organisations.
- Be able to communicate and disseminate scientific ideas.
- Ser capaces de acceder a la información necesaria en el ámbito específico de la materia (bases de datos, artículos científicos, etc.) y tener suficiente criterio para su interpretación y empleo.
- Aplicar el razonamiento crítico y la argumentación desde criterios racionales.
- Aplicar la Ciencia desde la óptica social y económica, potenciando la transferencia del conocimiento a la Sociedad.



- Capacidad para preparar, redactar y exponer en público informes y proyectos de forma clara y coherente, defenderlos con rigor y tolerancia y responder satisfactoriamente a las críticas que pudieren derivarse de su exposición.
- Proyectar la inquietud intelectual y fomentar la responsabilidad del propio aprendizaje.
- Asumir el compromiso ético y la sensibilidad hacia los problemas medioambientales, hacia el patrimonio natural y cultural.

LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

Learning results

Cross-sectional skills:

Instrumental:

1. - To acquire capacity of analysis and synthesis to being able to organize varied information or data.
2. - To develop organization and planning capacity.
3. - Capacity for oral expression, before a public audience, by means of presentations of a brief project or the involvement in debates or colloquia.
4. - Capacity to develop a written text.
5. - To develop knowledge of scientific English by means of the search, selection and management of bibliography in this language.

Systemics

1. - To develop autonomous and continuous learning.
2. - To adapt to new situations.
3. - To promote communication and discussion of contents to stimulate individual creative capacity.

Personal:

1. - To promote teamwork abilities and interpersonal skills and capacity to interact with peers.
2. - To develop the ability to debate based on rational criteria, differentiating clearly what is debatable from fact and scientific evidence (critical reasoning).
3. - To acquire social and professional conscience of on environmental problems and the importance of the biodiversity and its conservation.



Specific skills:

- 1.- To analyze the basic designs of animal organization (Bauplan) and the principles of classification animal as introduction to zoological diversity. To acquire practical abilities in handling techniques and specific terminology.
- 2.- To be aware and to value animal diversity (form: morphology and anatomy) and to identify the functional adaptations (function) allowing animals to occupy given ecological niches, as well as to study the interactions among them and with the environment (animal ecology).
- 3.- To identify the main animal taxa and to develop the techniques of capture, observation, preparation and conservation relative to the different groups.
- 4.- To analyze life history, biological development, life cycles and reproduction types in different animal phyla.
- 5.- To discuss and to analyze possible phylogenetic relationships between animal groups based on morphoanatomic, embryological, genetic, biochemical, ecological and other evidence. (Animal phylogeny).

DESCRIPTION OF CONTENTS

1. Animal diversity: Theoretical and practical aspects

FIRST SESSION. - Porifera. Spicular skeleton and diversity.

SECOND SESSION. - Cnidaria. Anatomy and diversity.

THIRD SESSION. - Flatworms. Anatomy and diversity.

FOURTH SESSION. - Annelids. Anatomy, locomotion and diversity.

FIFTH SESSION. - Molluscs I. Functional interpretation of gastropods and bivalves.

SIXTH SESSION. - Molluscs II. Mollusc dissection.

SEVENTH SESSION. - Arthropods I: morpho-anatomy of chelicerates and crustaceans.

EIGHTH SESSION. Arthropods II: morpho-anatomy of insects and miriapods.

NINTH SESSION. - Arthropods III: identification of insects orders.

TENTH SESSION. - Morphological study of the Echinoderms

ELEVENTH SESSION. Fish-shaped vertebrates. Morphological interpretation.

TWELFTH SESSION. Amphibian and reptile diversity.

THIRTEENTH SESSION. Avian reptile diversity.

FOURTEENTH SESSION. - Mammals. Functional interpretation of skulls.

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theory classes	14,00	100
Laboratory practices	10,00	100
Seminars	6,00	100
Development of individual work	10,00	0
Preparation of evaluation activities	7,00	0
Preparation of practical classes and problem	28,00	0
TOTAL	75,00	

TEACHING METHODOLOGY**Participative lectures (28 hours):**

Teachers will expose the fundamental concepts of each subject. The students will be oriented about the appropriate bibliography and resources for each session. Some topics will be complemented with **videos and animations**.

EVALUATION**Final exam (2 hours in person)**

A final test will be done, requiring a minimum grade five to remove material.

The voluntary resolution of the questions set will modulate the final mark with a maximum of +1.0 points.

REFERENCES**Basic**

- ALEXANDER, R. McN. (1990). Animals. Cambridge University Press. Cambridge. Reino Unido.
- DIAZ, J.A. & T. SANTOS (1998). Zoología. Aproximación Evolutiva a la Diversidad y Organización de los Animales. Ed. Síntesis, S.A. Madrid.
- BARNES, R.A., 1990.- Zoología de los Invertebrados. Interamericana. 957pp.
- ALEXANDER, R. M., 1994.- Bones. The unity of form and function. Weidenfeld & Nicolson: 223pp.



- BRUSCA, R.C. & G.J. BRUSCA (2005). Invertebrados. 2ª edición. Ed. McGraw Hill / Interamericana de España, S.A. Madrid. (Traducción de la versión en inglés de 2003).
- KARDONG, K.V. (2007). Vertebrados: Anatomía Comparada, Función, Evolución (4 ed.). Ed. McGraw Hill / Interamericana de España, S.A. Madrid.
- RUPPERT, E.E. & BARNES, R.D. (1996). Zoología de los Invertebrados. Ed. McGraw Hill / Interamericana de España, S.A. Madrid.
- HAISTON, N.G. (1994). Vertebrate Zoology. An Experimental Field Approach. Cambridge University Press. Cambridge. Reino Unido.
- WALKER, W.F. & LIEM, K.F., 1994. - Functional anatomy of the vertebrates. An evolutionary perspective. Saunders College Publishing. 788pp

Additional

- HAISTON, N.G. (1994). Vertebrate Zoology. An Experimental Field Approach. Cambridge University Press. Cambridge. Reino Unido.
- MCMAHON, T.A. & BONNER, J. T. (1986). Tamaño y Vida. Ed. Labor. Barcelona.
- LAVERACK, M.S. & DANDO, S. (1987). Lecture Notes on Invertebrate Zoology. Blackwell Scientific Publications. Oxford. Reino Unido.