COURSE DATA

Data Subject	
Code	33049
Name	Zoology
Cycle	Grade
ECTS Credits	10.0
Academic year	2019 - 2020

Study (s)

Degree	Center	Acad. year	Period
1100 - Degree in Biology	Faculty of Biological Sciences	2	Annual

Subject-matter

Degree	Subject-matter	Character
1100 - Degree in Biology	9 - Animal biology	Obligatory

Coordination

Name	Department
BALBUENA DIAZ-PINES, JUAN ANTONIO	355 - Zoology

SUMMARY

The subject “Zoology” is included within the area “Animal Biology”, which is compulsory in the Biology Degree. “Animal Biology” comprises 20 ECTS credits distributed in two consecutive academic years (second and third), allocated to two subjects running annually: “Zoology” (Animal Biology I: 2nd course) and “Animal Physiology” (Animal Biology II: 3rd course). The subject “Zoology” includes 10 ECTS credits and is structured around two blocks that, altogether, constitute an initiation to the discipline of zoology.

The first block includes the most general aspects. In order to approach the present hypotheses on the origin of the metazoans the study of diverse groups of allied protistans is indispensable. It also becomes necessary to deepen and expand aspects on animal development and architecture, and life cycles, that were preliminary covered by the subject “Biology” (1st course). This will allow settling the bases of animal classification, aspect with which will finalize this block of contents.

The second block is devoted to animal biodiversity, where the study of the most representative phyla of each body plan (“Bauplan”) is dealt with. In this sense, not all the animal phyla will be covered, but only

those that are more remarkable by their diversity, public health, ecological or phylogenetical importance.

The proposed set of contents and activities will provide to the students with basic knowledge to approach the subject “Animal Physiology” in the third course and, within the intensification programme of “Complements in Biodiversity and Conservation” will complement other subjets that cover diverse aspects of animal biology like “Animal Behaviour”, “Marine Biology” and “Conservation Biology”. In addition, “Zoology” is essential to follow the itineraries: “Animal Biodiversity and Conservation” and “Ecosystem Biodiversity and Conservation” within the master’s degrees “Biodiversity: Conservation and Evolution” at the University of Valencia and the subject "Applied Zoology" of interuniversity master on "Aquaculture".

In addition, given that the subjects “Zoology” and “Botany” run in parallel, this allows the co-ordination of activities, such as field courses, which helps optimize resources and students can better understand both subjects, devoted to the description of the biodiversity.

The interdisciplinary projects proposed within the subject will be developed as a cross-sectional activity jointly carried out with all the subjects of the second course.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

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

Other requirements

OUTCOMES

1100 - Degree in Biology

- Manejar correctamente la terminología científica y familiarizarse con las metodologías y fuentes de información de Biología Animal.
- Conocer el manejo de la instrumentación científica básica propia de la Biología Animal.
- Adquirir los conocimientos básicos imprescindibles que rigen la sistemática Zoológica y la filogenia.
- Aprendizaje e interpretación de los planes básicos de organización animal.
- Reconocimiento de los principales filos animales en base a su organización morfo-anatómica, hábitat y requerimientos ecológicos.
- Identificación e interpretación de estructuras y formas.
- Conocer y valorar las relaciones de los animales con su entorno biótico y abiótico.

- Adquirir conciencia del valor de la ética profesional.

LEARNING OUTCOMES

A variety of activities to acquire the main skills in this matter have been designed.

Cross-sectional skills:

Instrumental

1. - To acquire capacity of analysis and synthesis to being able to organize varied information or data by means of the proposed activities. **Activities: interdisciplinary projects, fieldwork logs.**

2. - To develop organization and planning capacity (guides, cronogram and agenda, are available from the first day of course).

3. - Capacity for oral expression, before a public audience, by means of presentations of a brief project or the involvement in debates of controversial subjects. **Actividades: seminarios interdisciplinares, colloquia, etc.**

4. - Capacity to develop a written text. **Activities: interdisciplinary projects, fieldwork logs, exams, etc.**

5. - To develop knowledge of scientific English by means of the search, selection and management of bibliography in this language. **Activities: complementary scientific article reading in theory classes; search and management of the information in interdisciplinary project.**

6. - To acquire knowledge of computer applications in an academic scope by means of self-learning in the computer classroom. **Activities: use of software for performance and interpretation of virtual dissections, development and classification excersises, as well as the implementation of the final presentation of interdisciplinary project in Power Point.**

Systemics

1. - To develop, by means of the different course activities, the independent and life learning. **Activities: bioinformatics, elaboration of seminaries and works, study of contents, search of information, etc.**

2. - To adapt to new situations. **Activities: field excursions.**

3. - To promote communication and discussion of contents to stimulate individual creative capacity.

Personal

1. - To promote teamwork abilities, developing and later presenting the interdisciplinary project. **Interdisciplinary projects, Field excursions**.

2. - To develop the ability to debate based on rational criteria, differentiating clearly what is debatable

from fact and scientific evidence (critical reasoning). **Activities: colloquia, lectures, seminars.**

3. - To acquire social and professional conscience of on environmental problems and the importance of the biodiversity and its conservation (ethical commitment). **Activity: Field excursions.**

4. - To promote interpersional skills and capacity to interact with both teachers and peers. **Activities: Field excursions, teamwork, practicals, colloquia, seminars, tutoring, etc.**

Specific instrumental skills:

These skills provide the student a vision of the different aspects about animal biology. The students in this subjet will acquire the following abilities:

- 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.

- 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).

- To identify the main animal taxa and to develop the techniques of capture, observation, preparation and conservation relative to the different groups.

- To analyze life history, biological development, life cycles and reproduction types in different animal phyla.

- Discutir y analizar posibles relaciones filogenéticas entre grupos animales a partir de evidencias morfoanatómicas, embriológicas, genéticas, bioquímicas, ecológicas, etc. (filogenia animal).

- To discuss and to analyze possible phylogentic relationships between animal groups based on morphoanatomic, embryological, genetic, biochemical, ecological and other evidence. (Animal phylogeny).

- To develop applied aspects in the use and animal handling in biological control of plagues, environmental impact studies (bioindicators) and in diverse industrial applications, among others.

DESCRIPTION OF CONTENTS

1. Basic aspects of the animal kingdom

TOPIC 1. - Zoology: concept and limits. Hypotheses on the origin of the animals. Animal-like Protista: the Protozoa.

TOPIC 2. - Development. Life cycles. Architecture. Animal phylogeny and classification.

2. Animal diversity.

In this block animal taxa will be studied, as specified below, following the same format, including the most important aspects about form and function, classification, ecology and phylogeny.

TOPIC 3. - Phylum Porifera. Body organization.

TOPIC 4. Phylum Cnidaria. Metagenesis and coral reefs.

TOPIC 5. Lophotrochozoa. Phylum Plathyhelminthes. Life cycles. Parasitism. Economic and sanitary importance.

TOPIC 6. Phylum Mollusca. Adaptive radiation. Economic and ecological importance.

TOPIC 7. Phylum Annellida. Metamerism and hydrostatic skeleton.

TOPIC 8. Ecdysozoa. Phylum Nematoda. Life cycles. Sanitary, economic and ecological importance.

TOPIC 9. Phylum Arthropoda. Arthropodization: tagmae and appendices. Body organization. Origin and diversification.

TOPIC 10. Main Athropoda groups. Ecological and economic importance.

TOPIC 11. - Deuterostomes. Phylum Echinodermata. Symmetry and ambulacral system.

TOPIC 12. - Phylum Hemichordata and phylum Chordata. Origin and evolution.

TOPIC 13. Pisciform vertebrates. Agnatha and Gnathostomata.

TOPIC 14. - Tetrapoda. First terrestrial vertebrates. Amphibians.

TOPIC 15. - Amnyotes and the cleidoic egg. Reptiles. Birds. Mammals.

3. Practicals

PRACTICAL 1. - Porifera. Spicular skeleton and diversity.

PRACTICAL 2. - Cnidaria. Anatomy and diversity.

PRACTICAL 3. - Flatworms. Anatomy and diversity.

PRACTICAL 4. - Mollusks I. Functional interpretation of gastropods and bivalves.

PRACTICAL 5. - Mollusks II. Mollusk dissection.

PRACTICAL 6. - Annelids. Anatomy, locomotion and diversity.

PRACTICAL 7. - Nematodes. Dissection of Ascaris sp. or extraction of Anisakis sp. from fish.

PRACTICAL 8. - Arthropods I: morpho-anatomy of chelicerates and crustaceans.

PRACTICAL 9. - Arthropods II: morpho-anatomy of insects and miriapods.

PRACTICAL 10. - Arthropods III: identification of insects orders.

PRACTICAL 11. - Indirect methods for vertebrate identification.

PRACTICAL 12. - Use of field guides for identification of terrestrial vertebrates.

PRACTICAL 13. Fish-shaped vertebrates. Morphological interpretation.

PRACTICAL 14. - Mammals. Functional interpretation of skulls.

Note: The order of the practical sessions can be altered due to organizational reasons

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	56,00	100
Laboratory practices	40,00	100
Tutorials	4,00	100
Development of group work	10,00	0
Study and independent work	140,00	0
TOTAL	**250,00**	

TEACHING METHODOLOGY

• **Participative lectures:** Teachers will expose the fundamental concepts of each subject. The students will be oriented about the appropriate bibliography and resources for each session. The time needed to cover each of the 15 topics will vary. Some topics will be complemented with videos and animations.

• **Laboratory practicals:** 14 practicals of 2-hr duration and coordinated with theoretical contents have been devised. Before each practice, the students will be handed and outline that will have to be read beforehand. During the session the instructor will introduce the objective of the practical and will brief the basic concepts that will be dealt with. During the rest of the session, the students will carry out the practical under the instructor's supervision.

• **Field excursion, zoology:** An itinerary will be carried out in a suburban or rural (to be decided based

on the organizational capacities) environment.

• **Interdisciplinary field excursions**: Two itineraries of didactic value will be carried out.

+ Excursion the Font Roja Natural Park (Alicante).

+ Excursion for observation and identification of birds and botanical transect in the Albufera Natural Park (Valencia).

In all the excursions (zoology and interdisciplinary) the students will exercise their capacities of observation, of direct and indirect identification of the fauna, of integration of the collected data and extraction of general ecological patterns. The students will work in teams of two to four individuals. Each student will take a registry of the observations made in a field log. The teams should be necessarily formed by students of the same practical subgroup.

Tutorials in reduced group (16 students): Tutorials will be compulsory and they will be carried out in two sessions of 2hr each in the dates indicated in the subject's calendar. In addition, rendering the questionnaires requested will be compulsory. One tutorial each will be held during the first and second semester. The tutorials will be devoted to solving questions posed by instructors. These will be aimed at extending, deepening or clarifying aspects covered by the lectures or at debating current topics related to the subject.

Individual tutorials: They will be used to solve specific questions or personal problems of the student with the subject. They could be run on site or through electronic mail.

Interdisciplinar project: execution and deliverance of a presentation. This is a cross-sectional activity common to all the subjets of the second course of the degree in Biology (Cell and Tissue Biology, Developmental Biology, Biochemistry, Botany, Genetics, Molecular Methods in Biology, Evolutionary Processes and Mechanisms, and Zoology). The activity is compulsory for all the students who are registered in the second course, except for those that carreid it out previously (and the mark has been awarded). Each work group, formed by three students, will carry out a project (that will consist of a written work and an oral presentation) about a subject assigned by drawing between the proposed ones by the teachers of the participant subjets in this activity. Each nterdisicplinary work will be considered tied (to its repercussion in evaluation of the activity below) to the subjet on which the assigned subject depends directly. To each works a tutor will assigned, who will oversee its execution and will supervise its presentation. A series of periodic meetings with the tutor throughout the academic year will be scheduled. In the beginning of the academic year, a calendar establishing the dates of these meethings, as well as the dealines will be made publicly available. In addition a co-tutor will be assigned, who will review the final version of the presented work. Each project will be presented orally by all the members of the group during 30 minutes. Presentations will be attended by all the students of the course, since the attendance is obligatory, and two teachers: the tutor and a companion instructor (other that the cotutor, chosen between the course teachers). Both students and instructors will participate in the selection of the projects that because of their quality and originality will be presented in the Congress of Biology, organized jointly by the first and second course of the degree in Biology.

Voluntary activities: The students will be able to carry out other complementary activities that complete their formation and active participation in the class, voluntarily and always **previous consultation to the instructor** during the first semester.

EVALUATION

There will be a continuous assessment of each student, based on onsite and distance activities. It will evaluate the participation in the activities onsite, the presentation and execution of projects and voluntary activities and participation and involvement in the learning-teaching process. Aspects to be assessed are:

• **Written tests on the contents of the course.** There will be a midterm and a final examination of the theoretical and practical contents, which will account for 60% and 30% of the grade, respectively. It will be a prerequisite for passing the subject to reach at least a score of 5 out of 10 in each of the tests.

- ***Assessment of the theoretical contents:***

At the end of the first term a midterm examination will be held, and it is necessary a minimum mark of five to pass.

If failed or not carried out, the contents covered by the midterm will be included in the June final exam, being a minimum mark of five required to pass.

Passed first and second term exams will be kept until the July call.

The average mark of the two exams will represent 95% of the theory mark.

- ***Assessment of the group seminars:***

The theoretical tests of the first and second term will include a question each corresponding to contents of each of the group seminars. In addition, the individual and group tasks carried out in the group seminars will represent 5% of the theory mark.

The mark obtained in group seminars passed in 2018-2019 could be used in the present academic year.

- ***Assessment of the laboratory practicals and field excursions:***

At the end of the first semester will be a midterm exam of the practical sessions, requiring a minimum grade five to remove material.

Failure to approve or carry out the first set, this will recover in the final practice exam, requiring the same minimum grade above pass grade.

Practical contents approved in the first or second semester will be saved until the July.

The final practical exam will include questions related to the three field excursions

That the students should answer based on the exercices indicated in the excurisons booklet and the annotations, and other recordings (e.g. photographs and sound recordings), consinged in the students personal field notebook, requiring a minimum grade five to remove material.

The marks obtained in voluntary and extra activities that the student had carried out will contribute to modulate the final grade of the practicals with a maximum value of +1.0 points.

Passed marks of practicals will be considered until the July call.

Attendance to the laboratory practical, field trips and group tutorials is compulsory. Unjustified absence to 20% of the hours devoted to each of these activities will result in a zero mark in the corresponding activity.

NO MARKS OF THEORY AND PRACTICALS WILL BE CONSIDERED FOR THE FOLLOWING COURSE.

- **Assessment of the interdisciplinary project:**

- The mark obtained in the interdisciplinary project will represent 10% of the grade of the course. Grading is carried out by the project's tutor and co-tutor,. The assessment of this activity includes both the scientific content covered and way it is presented, especially valuing the ability to communicate and transmit ideas and concepts. The projects selected for presentation at the Congress of Biology have an additional mark, equivalent to 10% of the overall project grade.
- In the case of failing the subject, the rating of the interdisciplinary work will be taken into account for the next course.
- In case the (mandatory) interdisciplinary project is not carried out, it will lead to failing the linked subject (i.e., the one proposing the topic and associate to the tutor), regardless of the grade obtained in the rest of the subject.
- Alternatively to this activity, any other transversal activity backed by the CAT as part of an innovative education can be carried out.
- In case of failing the course because of not carrying out the interdisciplinary activities or the alternative activity related to this subject the grade earned in the rest of the course in the case considered approved (i.e. obtaining a grade equal to or greater than 5 on a maximum of 9, in addition to meeting the other criteria needed to pass this course, as detailed in this Teaching Guide) will be saved. This rating is saved only until the next course, and will add to the grade obtained when the interdisciplinary activity is performed.
- In the event that the present subject is not the subject linked to the interdisciplinary work, if no interdisciplinary work is performed, in order to pass the subject it will be necessary to obtain a grade equal to or greater than 5 on a maximum of 9, not having scored in the interdisciplinary activity (in addition to complying with the rest of criteria needed for pass this subject, and which are detailed in this teaching guide).

- **The score on voluntary and complementary activities** obtained during 2018-19 could be considered in the present academic year.

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Basic

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ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

1. Continguts / Contenidos

Es mantenen els continguts inicialment arreplegats a la guia docent. / Se mantienen los contenidos inicialmente recogidos en la guía docente.

2. Volum de treball i planificació temporal de la docència

2. Volumen de trabajo y planificación temporal de la docencia

Es manté el pes de les diferents activitats que sumen les hores de dedicació en crèdits ECTS marcades en la guia docent original. Les sessions no presencials substitutòries de activitats presencials han sigut programades en les mateixes dates i hores amb la mateixa durada. / Se mantiene el peso de las distintas actividades que suman las horas de dedicación en créditos ECTS marcadas en la guía docente original. Las sesiones no presenciales sustitutorias de actividades presenciales han sido programadas en las mismas fechas y horas con la misma duración.

3. Metodología docente

3. Metodología docente

S'ha pujat a l'Aula virtual el material següent: (1) Una presentació i documents explicatius de les dues últimes sessions de teoria (grup A). (El grup B va acabar les sessions de teoria amb normalitat). (2) Quaderns de pràctiques i material explicatiu de les activitats no presencials al voltant de les pràctiques 13 i 14. (3) Material substitutiu de les eixides de camp. Les pràctiques 13 i 14 han sigut reemplaçades per activitats no presencials. Les tres eixides de camp programades (dues d'elles conjuntament amb l'assignatura de Botànica), per part de zoologia han sigut canviades per tres itineraris virtuals corresponents a les eixides. Se han habilitat fòrums a l'Aula virtual per debatre i aclarir dubtes corresponents a cadascuna de les activitats no presencials. Si una persona no disposa dels medis per establir esta connexió i accedir a l'aula virtual, haurà de contactar amb el professorat per correu electrònic en el moment de la publicació d'este annex a la guia docent. / Se ha subido al Aula virtual el material siguiente: (1) Una presentación y documentos explicativos de las dos últimas sesiones de teoría (grupo A). (El grupo B terminó las sesiones de teoría con normalidad). (2) Cuadernos de prácticas y material explicativo de las actividades no presenciales referentes a las prácticas 13 y 14. (3) Material sustitutivo de las salidas de campo. Las prácticas 13 y 14 han sido remplazadas por actividades no presenciales. Las tres salidas de campo programadas (dos de ellas conjuntamente con la asignatura de Botánica) se han cambiado por tres itinerarios virtuales correspondientes a las salidas. Se han habilitado fórums en al Aula virtual para debatir y aclarar dudas referentes a cada una de las actividades no presenciales. Si una persona no dispone de los medios para establecer esta conexión y acceder al aula virtual, deberá contactar con el profesorado por correo electrónico en el momento de publicación de este anexo a la guía docente.

4. Avaluació

4. Evaluación

La part teòrica serà avaluada mitjançant proves en l'Aula virtual: tipus test i proba oberta. Pel que toca les pràctiques i eixides al camp, seran avaluades amb probes obertes distribuïdes en l'Aula virtual. Si por raons tècniques, degudament justificades, algun estudiant no pogués realitzar algun examen, s'estudiarà la possibilitat de realitzar una proba alternativa que, en tot cas, serà de tipus ORAL/ La parte teórica será evaluada mediante pruebas en el Aula virtual: tipo test y prueba abierta. Respecto a las prácticas y salidas de campo, serán evaluadas con pruebas abiertas distribuidas en el Aula virtual. Si por causas técnicas, debidamente justificadas, algún estudiante no puede realizar algún examen, se estudiará la posibilidad de realizar una prueba alternativa que, en todo caso, será de tipo ORAL

5. Bibliografia

5. Bibliografía

La bibliografia recomanada es manté perquè és accessible / La bibliografía recomendada se mantiene pues es accesible.