Universitat Autònoma de Barcelona

2019/2020

Biology and Diversity in Arthropods

Code: 100790
ECTS Credits: 6

Degree	Type	Year	Semester
2500250 Biology	OT	4	0

Contact

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Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: No
Some groups entirely in Spanish: No

Teachers

Guillermo Peguero Gutierrez

Prerequisites

It is recommended to review the general concepts of Zoology and the characteristics of the main groups of Arthropoda studied in Advanced Zoology.

Objectives and Contextualisation

This course deals with the most complete vision possible of the Arthropods, the phyllum of animals with greater biological success, from an anatomical, functional, systematic and phylogenetic perspective.

In addition, each animal group is studied in an ecological context, in relation to the number of species, habitat and way of life, adaptations to different ecosystems, as well as its great evolutionary potential.

Competences

- Analyse and interpret the origin, evolution, diversity and behaviour of living beings.
- Be able to analyse and synthesise
- Be able to organise and plan.
- Control processes and provide services related to biology.
- Develop a sensibility towards environmental issues.
- Develop independent learning strategies.
- Obtain, manage, conserve and observe specimens.

Learning Outcomes

1. Analyse and interpret animal diversity and the phylogenetic lines of the metazoa.
2. Apply dissection methods to observe and analyse the internal anatomy of representative samples of the principal animal groups.
3. Apply methods for handling and conserving animal specimens.

4. Apply sampling methods to obtain animal specimens.
5. Apply techniques for the study of animal anatomy.
6. Be able to analyse and synthesise.
7. Be able to organise and plan.
8. Develop a sensibility towards environmental issues.
9. Develop independent learning strategies.
10. Provide services related to zoology.

Content

I. INTRODUCTION.

Phylogenetic situation of Arthropods. Relations between groups: main evolutionary hypotheses. The diversity within phylum Arthropoda. Current classification of the group.

II. CHELICERATED ARTHROPODS: EUCHELICERATES AND PYCNOGONIDS.

Characteristics, classification, phylogenetic relationships between the groups and geographic distribution. External morphology and anatomy. Biology (feeding, reproduction, ecology and behavior) and diversity of species. The current Euchelicerates: order Xiphosura and class Arachnida. Economic importance and applied aspects.

III. MANDIBULATED ARTHROPODS I: MYRIAPODS.

Characteristics of myriapods. Classification according to current theories. Phylogenetic relationships between groups and geographical distribution. External morphology and anatomy. Classes C*hilopoda, Diplopoda, Pauropoda* and *Symphyla*: diversity of species, biology (feeding, reproduction, ecology and behavior), economic importance and applied aspects.

IV. MANDIBULATED ARTHROPODS II: CLADE PANCRUSTACEA. CRUSTACEANS.

Current classification of clade groups Pancrustacea: *Crustacea* and *Hexapoda*.
Characteristics of the paraphyletic group of Crustaceans. Phylogenetic relationships between groups and species diversity. External morphology and anatomy. Biology (feeding, reproduction, ecology and behavior), economic importance and applied aspects.

V. MANDIBULATED ARTHROPODS III: HEXAPODS.

Characteristics of Hexapods. Phylogenetic relationships between groups and species diversity. External morphology and anatomy. Biology (feeding, reproduction, ecology and behavior), economic importance and applied aspects.

PROGRAM OF PRACTICES

Field practices: Sampling to know the richness of species of arthropod groups.

Laboratory practices: Identification of the arthropods of an ecosystem. Identification and classification of specimens. Methodologies of laboratory work.

Methodology

The methodology used in this course to achieve the learning process is based on the student work with available information. The function of the professor is to give you the information or indicate where the student can get it, helping and supervising the student durint the learning process. To achieve this goal, the course is based on the following activities:

Lectures:

In these classes the students acquire the basic scientific-technical knowledge of the subject that must be complemented with the personal study of the topics explained.

Seminars:

The mission of the seminars is to promote the capacity for analysis and synthesis, critical reasoning and the capacity to solve problems.

Practical Classes:

In the field practices a systematic sampling of groups of hexapods and other arthropods will be carried out. Methods of capture and techniques to study arthropods cwill be used, which involve the preparation of traps and sampling design.

In the laboratory practical sessions, the zoological material will be identified and classified. The objective of the practical sessions is to complete and reinforce the zoological knowledge acquired in the theoretical classes and seminars. In the practical sessions students are stimulated and develop empirical skills such as the ability to observe, analyze and recognize the diversity of arthropods.

Tutorials:

The objective of these sessions is to solve doubts, review basic concepts not explained in class and guide about the sources consulted by the students. Likewise, these tutorials allow the orientation of the works that will be carried out in the seminars. The schedule of the tutorials is specified with the teaching staff through the virtual campus.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Fieldwork practices	8	0.32	1, 4, 3, 9
Laboratory practical classes	18	0.72	1, 2, 3, 5, 9, 7
Lectures	22	0.88	1, 9, 10
Seminars	6	0.24	1, 9, 10, 8, 6, 7
Type: Supervised			
Tutorials	4	0.16	1, 2, 5, 9, 10
Type: Autonomous			
Study and solve problems	50	2	1, 2, 4, 3, 5, 9, 10
Written reports, answer to questions	33	1.32	1, 2, 4, 3, 5, 9, 10

Assessment

There is a continuous evaluation process throughout the course that includes more than three evaluation activities, of different typologies, distributed throughout the course, and none of the activities represents more than 50% of the final grade.

A. Evaluation of seminars:

Attendance at seminar sessions is mandatory.

There is an individual and a group evaluation during the seminars. The individual and group evaluation weighs 20% of the final grade. In this activity there is no chance for re-assessment.

B. Evaluation of the exams:

Partial exams:

In this part, the knowledge acquired by the students during the course is evaluated individually, as well as their capacity for analysis and synthesis, and critical reasoning. The exam may have multiple choice questions or conceptual questions, diagrams, etc.

There are two partial exams of the course, each with a weight of 30% of the overall mark.

Final exam:

Students who do not pass one of the two partial exams (minimum grade: 5 out of 10) can re-asses the exam failed in the final exam. Likewise, students who wish to improve a grade in one or both of the parts can do the final exam, but they will lose the previous grade.

The corresponding grade for each of the two exams weighs 30% of the final grade.

To be able to make the average with the other evaluative activities (seminars and practices) the average mark of the two exams must be equal to or greater than 4.

C. Evaluation of the practices:

Attendance at labsessions and field practices is mandatory. There are three evaluation activities in the practices:

Teaching folder:

It consists of a series of learning material thatis made duringthe different activities of practices (outputs and laboratory) and that students accumulate throughout the course. These materials can be the elaboration of an identification guide of an ecosystem, files of follow-up of the exits, field notes of the observations, small tests of evaluation on some practice or exit, etc. In this activity there is no chance for re-assessment.

Observation record:

The aim is to identify if the students reach competences of a more attitudinal nature through the observation by the professors of their attitude in the different types of activities that take place in the practices (fieldwork and laboratory sessions). This activity has a value between -1 and 1 that is added in the practical grade reached by the previous evaluations. In this activity there is no chance for re-assessment.

The final grade obtained in the practices, has a global weight of 20% of the final grade.

D. Final considerations:

The minimum grade of each one of the activities necessary to make average with the rest of activities is 4. The minimum global qualification necessary to pass the course is 5 out of 10.

To be eligible for the retake process, the student should have been previously evaluated in a set of activities equaling at least two thirds of the final score of the course or module. Thus, the student will be graded as "*No Avaluable*" if the weighthin of all conducted evaluation activities is less than 67% of the final score.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Evaluation of practices	20%	2.25	0.09	1, 2, 4, 3, 5, 9, 10, 6, 7
Evaluation of seminars	20%	2.25	0.09	1, 9, 10, 8, 6
Partial exam I (final exam I)	30%	2.25	0.09	1, 5, 9, 6
Partial exam II (final exam II)	30%	2.25	0.09	1, 5, 9, 6

Bibliography

I. THEORY:

ANDERSON, D.T., 2001. *Invertebrate Zoology. Second edition.* Oxford University Press, Melbourne. BARNES (2009). Zoología de los Invertebrados. Ed. MacGraw-Hill. Interamericana.

BRUSCA R.C. & BRUSCA, G.J. 1990. Invertebrates. Sinauer. Sunderland.

EBERMANN, E., 1998. Arthropod Biology. Österr.Akad.Wiss, Viena.

FOLCH I GUILLEM, R. (Ed.), 1986. Historia natural dels Països Catalans. Vol. 9. Artròpodes I. Enciclopedia Catalana.

FOLCH I GUILLEM, R. (Ed.), 1986. Historia natural dels Països Catalans. Vol. 10. Artròpodes II. Enciclopedia Catalana.

GRIMALDI, D. & ENGEL, M.S., 2005. Evolution of the Insects. Cambridge University Press.

DE LA FUENTE, J.A., 1994. Zoología de Artrópodos. McGraw-Hill.

GULLAN, P.J. & CRANSTON, P.S., 2010. The Insects. An Outline of Entomology. Blackwell. Oxford.

MARSHALL, S. 2006. Insects. Their natural history and diversity. Firefly Books.

McGAVIN. G., 2001. Essential entomology: an order-by-order introduction. OUP Oxford.

MEGLITSCH, P.A. & SCHRAM, F.R., 1991. Invertebrate Zoology. Oxford University Press, New York.
MINELLI, A., BOXSHALL, G. & FUSCO, G., 2013. Arthropod Biology and Evolution: Molecules, Development, Morphology. Springer.

RUPPERT, E.E. & BARNES, R.D., 1996. Zoología de los Invertebrados. McGraw-Hill.

SNODGRASS, R.E., 1993. Principles of insect morphology. Cornell University Press.

VARGAS, P. & ZARDOYA, R. (Eds.), 2012. El árbol de la vida: sistemática y evolución de los seres vivos. Madrid.

II. PRACTICES:

BARRIENTOS, J.A., 2004. Curso práctico de Entomología. Asociación Española de Entomología, CIBIO-Centro Iberoamericano de Biodiversidad & Universitat Autònoma de Barcelona.

CHINERY, M., 1997. Guía de campo de los insectos de España y Europa. Ed. Omega.

VILA, R., STEFANESCU, C. & SESMA, J.M., 2018. Guia de les papallones diürnes de Catalunya. Lynx Edicions.