

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

Code	43247
Name	Animal adaptations to marine environments
Cycle	Master's degree
ECTS Credits	3.0
Academic year	2023 - 2024

Study (s)

Degree	Center	Acad. year	Period
2148 - M.D. in Biodiversity: Conservation and Evolution	Faculty of Biological Sciences	1	First term

Subject-matter

Degree	Subject-matter	Character
2148 - M.D. in Biodiversity: Conservation and Evolution	4 - Integral aspects of animal diversity	Optional

Coordination

Name	Department
PEÑA CANTERO, ALVARO LUIS	355 - Zoology

SUMMARY

The concept of biodiversity encompasses many different aspects at different biological scales. The general objective of this course is to address the study of biological diversity in relation to the adaptations and life strategies of marine animals. The aim is that students know which are the fundamental mechanisms and adaptations that marine animals present to face their vital requirements.

PREVIOUS KNOWLEDGE**Relationship to other subjects of the same degree**



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

Other requirements

None.

OUTCOMES

2148 - M.D. in Biodiversity: Conservation and Evolution

- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.
- 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.
- To acquire basic skills to develop laboratory work in biomedical research.
- Be able to access the information required (databases, scientific articles, etc.) and to interpret and use it sensibly.
- Stimulate the capacity for critical reasoning and for argumentation based on rational criteria.
- Favour intellectual curiosity and encourage responsibility for one's own learning.

LEARNING OUTCOMES

To get:

- An integrated vision of the subject, enabling the knowledge acquired to be interrelated and applied.
- Correct handling of the terminology used.
- Knowledge, and devises to use the sources of scientific information.
- Ability to retrieve, analyse and synthesise scientific information.
- Ability to present and disseminate scientific information.
- Ability to work in a group when faced with problematic situations.
- Elaboration of comprehensible and well-organised written texts.
- Making public oral presentations in a clear and coherent manner, encouraging communication and discussion of contents.
- Obtaining relevant information to face new scientific challenges.



- Critical thinking.
- Acquiring interpersonal skills, responsibility, autonomy, teamwork, decision-making and entrepreneurial spirit.

DESCRIPTION OF CONTENTS

1. The marine environment

Zonation and characteristics of the pelagos and benthos.

2. Intertidal

Water loss, temperature, mechanical stress, salinity, respiration, feeding, and predation.

3. Temperature

Adaptative strategies of poikilotherms and homeotherms.

4. Estuaries and Osmoregulation

Adaptative strategies related to ion regulation.

5. Perceiving the environment

Photoreceptors, Mecanoreceptors (Statoreceptors and Phonoreceptors) and Chemoreceptors. Electoreception and Magnetoreception.

6. Buoyancy and nekton

Principles. Adaptations to buoyancy in the plankton. Nekton: buoyancy and locomotion, defence and camouflage, echolocation, schooling, migration and diving.

7. Bioluminescence and Deep Sea

Bioluminescence. Adaptations to the deep ocean: light, food, reproduction, sediment, abyssal gigantism.

**8. Getting the food**

Feeding strategies: deposit feeders and suspension feeders, herbivorous, predation (defence and camouflage), symbiosis.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	20,00	100
Laboratory practices	10,00	100
Development of group work	20,00	0
Study and independent work	25,00	0
TOTAL	75,00	

TEACHING METHODOLOGY

The theoretical classes will be developed following the model of a master class, since it is the model that allows to emphasize the most essential of each subject and to control the appropriate development of the subject.

Seminars, which are compulsory, will be prepared by the students on topics proposed by the teacher in order to go deeper into topics of special interest. Students will prepare oral presentations on these topics, which will be presented in class and handed in for assessment.

Tutorials will be held to solve the questions and doubts raised by the students with respect to the topics explained.

All the activities will be managed through the University of Valencia's Virtual Classroom platform, which will also serve as a means of communication.

EVALUATION

The evaluation will be carried out by means of two mechanisms. On the one hand, there will be a written test, with the aim of assessing the assimilation and understanding of the contents of the subject. This written exam will have a maximum value of 7 points (out of 10). On the other hand, a maximum of 3 points (out of 10) will be awarded for the seminar and its presentation in class, which is compulsory. The contents of the different presentations may also be considered in the written test.

In order to pass the course, and add the grade for the seminar presented in class, it will be necessary to pass the written exam, for which a minimum of 5 points (out of 10) must be obtained.



REFERENCES

Basic

- Bradley, T.J. (2009) Animal Osmoregulation. Oxford University Press.
- Castro, P., Huber, M.E. (2016) Marine Biology. McGraw-Hill Education.
- Helfman, G.S., Collette, B.B., Facey, D.E., Bowen, B.W. (2009) The Diversity of Fishes. Biology, Evolution, and Ecology. Wiley-Blackwell.
- Levinton, J.S. (2009). Marine Biology. Function, biodiversity, ecology. Oxford University Press.
- Nybakken, K.J. (1983). Marine Biology: an ecological approach. Wiley. Chichester.
- Randall, D.J., Farrell, A.P. (1997) Deep-Sea Fishes. Academic Press.
- Willmer, P., Stone, G., Johnston, I. (2005) Environmental Physiology of Animals. 2nd edition. Blackwell Publishing.