

# Marine Environment Biology (250557)

## General Information

<b>School</b>	ETSECCPB
<b>Departments</b>	Departament d'Enginyeria Agroalimentària i Biotecnologia (DEAB)
<b>Credits</b>	6.0 ECTS
<b>Programs</b>	GRAU EN CIÈNCIES I TECNOLOGIES DEL MAR (pla 2018)
<b>Course</b>	2024/25

## Main teaching language at each group

- Group 11 Spanish (Q2)
- Group 12 Spanish (Q2)

## Faculty

Responsible Faculty: Maria Isabel Achaerandio Puente, Marta Balsells Fernández-pedrerà  
Faculty: Maria Isabel Achaerandio Puente, Sara Balbuena Pecino, Marta Balsells Fernández-pedrerà

## Objectives of Education

This course reviews the fundamentals of the main natural processes that take place in marine aquatic ecosystems and that affect their dynamics, their interrelations and biodiversity.

- 1.- Learn and understand the functional and taxonomic diversity of marine organisms.
- 2.- Understand the relationship between marine biodiversity, the different habitats and environmental conditions, as well as understand the interaction between different populations, communities and ecosystems.
- 3.- Learn how to apply different basic methodologies for the collection, pre-processing and analysis of biological data.

## Competencies

### Especific

To know and apply the lexicon and concepts of the Marine Sciences and Technologies and other related fields.

Establish a good practice in the integration of common numerical, laboratory and field techniques in the analysis of any problem related to the marine environment.

To set, evaluate and propose solutions to the different conflicts of use and exploitation in the marine and coastal environment resources based on scientific and technical criteria.

### Generic

Develop a professional activity in the field of Marine Sciences and Technologies.

Address in a comprehensive manner the analysis and preservation of the marine environment with sustainability criteria.

Apply knowledge and academic experience to the biotic and abiotic resources of the marine environment, explaining their interactions with the socio-economic activities that take place in it.

## Total hours of student work

		Hours	Percentage
Supervised Learning	Large group	40.02 h	66.70 %
	Medium group	0.0 h	0.00 %
	Laboratory classes	19.98 h	33.30 %
	Guided Activities	0.0 h	0.00 %
Self Study		90.0 h	

## Contents

### Introduction to marine biology

Marine biodiversity: general concept. Genetic, species biodiversity and ecosystems

Operation of marine organisms: Principles of animal and plant physiology. Response to environmental adaptations.

Ecosystems: structure, conditioning factors and interactions. Marine environments: Pelagic region, benthic region.

### Specific Objectives

The objective of this subject is to understand the concept of marine biodiversity, the main groups of species that contribute and the importance for the marine environment

Understand the basic principles of operation of marine organisms (plants and animals) and their adaptation mechanisms (ecophysiology) to environmental conditions

Understand the relationships of marine organisms between them and the environment in which they live.

Learn about the main marine environments, their general characteristics and those of the communities that inhabit them

### Marine environments

Plankton and neuston communities. Factors that condition pelagic life

Primary or autotrophic producers. The phytoplankton. Photosynthesis and chemosynthesis. Distribution and diversity. Main groups of phytoplankton organisms

Primary consumers: zooplankton. Distribution and diversity. Main groups of zooplankton organisms

Secondary and tertiary consumers: large invertebrates and vertebrates. Main groups of organisms

Factors that condition benthic life. Primary producers: bacteria, algae. Consumers and decomposers. Main groups of organisms

Algae: characteristics, distribution, diversity. Main groups of algae.

Life in coastal areas with tides: intertidal zone, beaches, mangroves and estuaries

Life on the coast without tides: rocky coastlines, beaches, wetlands, deltas

### Specific Objectives

Learn the main groups that make up the communities of plankton and neuston, as well as their characteristics and the factors of the environment that determine their life.

### Practical activities

The student will have to carry out a work of identification of species from the instructions that will be provided in the classroom

The student will have to carry out a necropsy to understand the principles of the physiology of fish and other marine species

The student will have to build a simplified model of a marine ecosystem, based on a specific choice of species and environmental conditions

The research facilities of the Institute of Sciences of the Sea of Barcelona (CSIC) will be visited where there will also be a lecture on the latest advances in research in marine biology

## Activities

### Exhibitions

A course work will be carried out that integrates the concepts reviewed in the subject and in which the student demonstrates his capacity for autonomous work and his ability to efficiently use the information resources

### Dedication

4h

### Field trip

There will be a field trip related to the theoretical concepts explained in the classroom.

### Dedication

6h

## Teaching Methodology

The course consists of 2,3 hours per week of classroom activity (large size group) and 1,2 hours weekly with half the students (medium size group).

The 2,3 hours in the large size groups are devoted to theoretical lectures, in which the teacher presents the basic concepts and topics of the subject, shows examples and solves exercises.

The 1,2 hours in the medium size groups is devoted to solving practical problems with greater interaction with the students. The objective of these practical exercises is to consolidate the general and specific learning objectives.

The rest of weekly hours devoted to laboratory practice.

In addition, it is proposed a visit to the Institut de Ciències del Mar, which will be in a large group. During the course other interesting opportunities for visits or conferences may arise that will be adjusted to the schedule of the subject.

Support material in the form of a detailed teaching plan is provided using the virtual campus ATENEA: content, program of learning and assessment activities conducted and literature.

Although most of the sessions will be given in the language indicated, sessions supported by other occasional guest experts may be held in other languages.

## Grading Rules

*(\*) The evaluation calendar and grading rules will be approved before the start of the course.*

The mark of the course is obtained from the ratings of continuous assessment and their corresponding laboratories and/or classroom computers.

Continuous assessment consists of doing different activities, both individual and group, of an additive and formative nature, carried out during the course (inside and outside the classroom and the practicals). The continuous assessment grade is the weighted arithmetic average of the work/exhibition (Tr) carried out during the course, of the directed activities such as practical work or reports (Pr) and of the partial exams (Ex, which will have the same value).

The laboratory teaching grade (Pr) is the average of the activities of this type, and is worth 20% of the final grade.

Two mid-term exams will be taken and will count for 70% of the grade. These exams consist of questions on

concepts associated with the learning objectives of the subject in terms of knowledge or understanding.

In addition, a group work with a subsequent presentation (Tr) is worth 10% of the course.

The final grade will be  $EO=0.7*(\text{average of Ex1 and Ex2})+0.20*(\text{average of Pr}) +0.10*(\text{average of Tr})$ .

In order to pass the course, students must have attended at least 80% of the practicals.

To pass, the final mark (Ex+Tr+Pr) must be greater than or equal to 5.

Re-evaluation:

Qualification criteria and admission to re-evaluation (Re):

Students failed at the ordinary assessment who have regularly sat the assessment tests of the failed subject will have the option to take a re-evaluation test in the period set in the academic calendar. Students who have already passed the re-evaluation test of a subject and students who have not handed in all the exercises/problems (Pr) and the assignments and reports (Tr) will not be able to sit the re-evaluation test of a subject.

The re-evaluation (RE) will consist of a single exam covering the whole course content. The maximum mark for the re-evaluation will be five (5.0) and the final mark for the course will be the maximum mark between the continuous assessment and the re-evaluation exam, i.e.  $MAX(EO/RE)$ .

The non-attendance of a student summoned to the re-evaluation test, held in the fixed period, may not give rise to the taking of another test at a later date. Extraordinary assessments will be carried out for those students who, due to accredited force majeure, have not been able to take any of the continuous assessment tests. These tests must be authorised by the corresponding Head of Studies, at the request of the teacher responsible for the subject, and will be held within the corresponding teaching period.

## Test Rules

Failure to perform a laboratory or continuous assessment activity in the scheduled period will result in a mark of zero in that activity. The tests will be taken individually, with multiple-choice questions.

## Office Hours

Every Friday from 9 to 10 there will be hours of attention for the subject. However, you can request a meeting with the faculty of the subject through an email.

## Bibliography

### Basic

- Fincham, A.A. [Biología marina básica](#). Barcelona: Omega, DL 1986. ISBN 8428207976.
- Levinton, Jeffrey S. [Marine biology : function, biodiversity, ecology](#). Fifth edition. New York: Oxford University Press, 2018. ISBN 9780190625276.

### Complementary

- Wallace, R.L.; Taylor, W.K. [Invertebrate zoology: a laboratory manual](#). 5th ed. Upper Saddle River (N. J.): Prentice Hall, 1997. ISBN 0132700263.
- Ballesteros, E.; Llobet, T. [La vida marina del mar Mediterráneo](#). Gallocanta, 2015. ISBN 9788415885269.
- Graham, L.E.; Graham, J.M.; Wilcox, L.W. [Algae](#). 2nd ed. San Francisco (Calif.): Benjamin Cummings, 2009. ISBN 9780321559654.