UAB
Universitat Autònoma de Barcelona

Marine Science

Code: 106769
ECTS Credits: 6

2025/2026

Degree	Type	Year
Environmental Sciences	OB	2

Contact

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Teachers

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

There are no specific prerequisites.

Objectives and Contextualisation

The objective of this subject is to provide a base training in the knowledge of the marine environment, which encompasses aspects of physics, chemistry and geology, as well as the field of living organisms and their interrelations. The aim for the student is to have an overview of the structure of the marine ecosystem and its biodiversity, introducing the students into the study of the most remarkable cases of the interaction of man's activity on the marine environment, and to be able to understand its consequences.

Learning Outcomes

1. KM46 (Knowledge) Identify the most important chemical and geological processes in the different environmental compartments (hydrosphere, soil and atmosphere).
2. KM47 (Knowledge) Recognise the way in which human activity has an impact on the function of physical vectors (water, soil, oceans, atmosphere) in the natural environment.
3. KM48 (Knowledge) Compare the basic principles of science (hydrology, marine sciences, climatology, soil sciences, etc.) that constitute the basis for the study of the Earth system from an environmental perspective.

4. SM46 (Skill) Characterise the main processes of natural environments (marine, soil, atmosphere), including aspects of physics, chemistry, geology, biology and their interaction.

Content

Classes of theory and problems

- Introduction to Oceanography
- Structure and Evolution of the Oceans: Origin of the Earth and oceans; Interactions between tectonic plates; Structure of the oceans
- Bathymetry, Sediments, and Paleoceanography: Bathymetry; Sediments and composition of the seafloor; Origin of sediments
- Ocean Water: Properties of water; Temperature, salinity, density; Composition of ocean water; Impacts of climate change on oceans
- Ocean Circulation: Surface water movements: Coriolis effect, currents, gyres, eddies, upwelling; Deep water movements: thermohaline circulation
- Waves and Tides: Characteristics, types, and movement of waves; Wind-generated waves; Tsunamis; Tides
- Ocean Chemistry: Chemical composition of the oceans; Macronutrient cycles: C, P, N, Si; CO_2 and gas exchange with the atmosphere; Micronutrients
- Biological Oceanography: Classification of marine environments and organisms
- Marine Communities: Pelagic Domain: Primary production and phytoplankton; Zooplankton and nekton; Adaptations to pelagic life; Horizontal and vertical migrations
- Marine Communities: Benthic Domain: General features; Composition and distribution; Supralittoral, mediolittoral, infralittoral, circalittoral (coralligenous) in rocky and sandy bottoms; *Posidonia oceanica* community and other habitats of special interest
- Marine Communities: Deep-Sea: Bathyal, abyssal, and hadal domains; Composition and adaptations
- Feeding and Reproductive Strategies in the Sea
- Biotic Interactions: Competition and coexistence; Predation in the benthos and plankton
- Energy Transfer: Trophic webs
- Human Impact: Industrial and agricultural facilities and activities; Exploitation of abiotic and biotic resources

Practical part:

- Practice 1 (Field): Collection of biological samples and measurement of abiotic parameters in the coastal area. Labeling and preservation.
- Practices 2 and 3 (Laboratory): Processing of collected samples. Separation, analysis, and identification of biological material. Data collection and recording. Data treatment and interpretation. Reflection on writing a technical report or scientific article.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Field practice	4	0.16	KM46, KM47, KM48, SM46, KM46
Laboratory practice	6	0.24	KM46, KM47, KM48, KM46
Master classes	34	1.36	KM46, KM47, KM48, SM46, KM46
Practical examples (solving problem classes)	4	0.16	KM46, KM47, KM48, SM46, KM46
Type: Supervised			
Tutorials	2	0.08	
Type: Autonomous			
Preparation of work, resolution of cases	40	1.6	KM46, KM47, KM48, KM46
Self study and self-study work	53	2.12	KM46, KM47, KM48, KM46

Master Classes
The content of the theory program will be taught by the teacher mainly in the form of master classes. The theoretical classes will be complemented with the visualization of animations and videos related to the subjects treated in class. The material used in class by the teacher will be available on the Virtual Platform. It is recommended that students bring this material to class to use it as a support when taking notes. With these classes the student acquires the basic knowledge of the subject that must complement the personal study of the topics explained.

Practical examples (cases) (solving problem classes)
The master classes will be complemented with acivities of evaluation of the learning by means of the resolution of practical cases using the software Ocean Data View (ODV).

Either in the master or the solving problem classes, there will be some work that will consist of directed workclasses, where they will discuss in groups current topics previously programmed by the teacher. Later, the subjects will be exposed by part of the students in group.

Field and laboratory practices:
The practice of field will consist of the exit to a beach of the Catalan coast for the collection of biological samples and measure of abiotic parameters of the coastal zone.

The laboratory practice will be used for the processing of samples: separation of samples, analysis, identification, data collection. Finally, the treatment of results will be carried out.

Based on the data collected in the field and the results obtained in the laboratory, a group reflection will be carried out on the usefulness of the recorded data, and the necessary elements to include in a scientific article or technical report will be discussed.

Tutorials
The purpose of these sessions is to solvedoubts, to review basic concepts not explained in class and to guide the sources consulted by students. The hours of individualized tutorials will be specified with the teacher.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Case resolution	10	1	0.04	
Midterm exam 1	30	1.5	0.06	KM46, KM47, KM48, SM46
Midterm exam 2	30	1.5	0.06	KM46, KM47, KM48, SM46
Oral assessment	10	1	0.04	SM46
Work presentation	20	2	0.08	KM46, KM47, KM48, SM46

Exams:

Partial exams: With the partial ones the students' knowledge in the subject will be assessed individually, as well as their capacity for analysis and synthesis, and of critical reasoning.
There will be 2 obligatory partial exams, with a weight of 30% each one.

Evaluation of case solving:

Resolution of cases will be submitted during the course. The evaluation of the resolution of the cases raised in class will have a weight of 10% of the final mark. There will be no recorvey opportunity of this mark.

Presentation of targeted group work:

The assessment of the project will be done in relation to the oral presentation of all the members of each group. This activity represents 20% of the final grade. There will be no recorvey opportunity of this mark.

Assessment of practices:

Attendance and participation in the laboratory (PLAB) and field (PCAM) practicals, along with the completion of a paired interview (oral assessment), will account for 10% of the final grade in the course. Attendance at all practical sessions is mandatory. This grade cannot be retaken or recovered.

Retrieval:

To pass the course, the average grade obtained must be equal to or higher than 5 (out of 10), and the grade for each of the midterm exams must be equal to or higher than 4 (out of 10). To be evaluated, attendance at the field trip and submission of the group works are required.

Those students that do not get the minimum grade to pass the course have the option of a retrieval exam, repeating one or the two midterm exams.

Not evaluable:

Students who have been evaluated in less than 25% of the assessable activities will receive a final grade of NOT ASSESSABLE

Single assessment:

The single assessment consists of a single summary test in which the contents of the entire theory program of the subject will be assessed. The single assessment test will coincide with the same date fixed in the calendar for the last continuous assessment test and the same recovery system will be applied as for the continuous assessment.

Students who take the single assessment must do the field and laboratory practices in face-to-face sessions and it is a requirement to have them approved. Attendance at the oral defence session of the targeted group work will also be compulsory.

The assessment of PLAB, PCAM and PAUL will follow the same procedure as the continuous assessment.

Bibliography

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Software

Apart from the basic software, the rest will be free software, such as the R program or the Ocean Data View (https://odv.awi.de/). You will not be required to purchase any licensed software.

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this link. To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	1	Catalan	second semester	morning-mixed

(PAUL) Classroom practices	2	Catalan	second semester	morning-mixed
(PCAM) Field practices	1	Catalan	second semester	morning-mixed
(PCAM) Field practices	2	Catalan	second semester	morning-mixed
(PCAM) Field practices	3	Catalan	second semester	morning-mixed
(PCAM) Field practices	4	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	1	Catalan	second semester	afternoon
(PLAB) Practical laboratories	2	Catalan	second semester	afternoon
(PLAB) Practical laboratories	3	Catalan	second semester	afternoon
(PLAB) Practical laboratories	4	Catalan	second semester	afternoon
(TE) Theory	1	Catalan	second semester	morning-mixed