UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Environmental Lab

2526-2-F7502Q048-F7502Q040M

Aims

The overall aim of the course is to transfer the theoretical knowledge acquired from previous course into practical research activities on the field aimed at monitoring and investigating different Mediterranean marine habitats with a multidisciplinary approach combining the analysis of both living and dead assemblages with the assessment of abiotic parameters controlling the distribution of the organisms (and in particular carbonate producing organisms).

In detail, the Environmental Lab aims at equipping the students with monitoring techniques for the marine environments based on the analysis of the benthic invertebrate fauna and the benthic flora and their relationship with environmental parameters. The analysis will include both living and dead assemblages, in order to track the paleoenvironmental evolution of the environment.

The students should become able to understand technical documents related to the conditions and distribution of marine environments as well as read technical data related to them (DdD1). They should also be able to read habitat and geological maps (DdD1).

The course activities should provide the students with the capacity to draft experimental protocols to assess the status of the marine benthic environment and provide institutional stakeholders with data-based solutions to environmental problems (DdD2). The module of the course will also allow the students to frame, understand, and assess, from the geological point of view, a marine environment (DdD2).

The final test, by focusing on their ability to organize and expose scientific data, will also aim at strengthening their communication skills (DdD4) and their ability to autonomously elaborate the data (DdD5).

Contents

Basic elements of sedimentology, geology and coastal geomorphology, reading of geological maps an habitat maps, sampling techniques for benthic communities, monitoring techniques for coastal environments, identification

of benthic assemblages, analysis and processing of data on benthic assemblages.

Detailed program

Pre-field work lesson (a 2-hours asynchronous remote teaching activity, 2h, DI):
Refresher on the effect of the effects of the various environmental and geological parameters on benthic communities; analysis of geological and habitat maps; environmental and geological overview of the area of field activities. This activity will be followed by an e-learning test that will help the student to self-asses his knowledge and his comprehension of these contents.

Campus abroad (field activities, in person, interactive mode 24 h, DI):

1. Analysis of the study area with the help of geological and geomorphological maps; exploration of the study area with a focus on coastal sedimentary processes, coastal erosion, human activities and their effect on the environment.
2. Monitoring of the main environmental parameters (temperature; water turbidity; currents) and of the sea-floor (mapping of the habitats).
3. Preparation of the sampling protocol and sampling activities of the benthic community of selected habitats.
4. Sample preparation and preliminary analysis of the various samples.
5. Integrative sampling.
6. Preliminary analysis of the data with a focus on the relationship between benthic communities and environmental parameters.

Post-field work lessons (a 2-hours asynchronous remote teaching activity, 2h, DE; a 2-hours synchronous teaching activity, interactive mode, 2h DI):

1. Analysis of the samples and detailed taxonomic analysis of certain groups of benthic carbonate producing organisms of the benthic community.
2. Quantification of the abundance of the various groups of organisms.
3. Data analysis and data processing
   The first lesson will show the students the result of the analysis of the collected samples. The second lesson will be the discussion of the results of the analysis.

Prerequisites

Basic knowledge of geology, paleontology, sedimentology and marine geomorphology (Geobiology course is highly recommended)

Overall, regarding the field activities (Campus Abroad activities), each student must have the possibility to independently reach the Campus Abroad location and a small contribution from the students, in order to cover accommodation expenses, might be required. The attendance of the field activities is mandatory

Teaching form

One 3-hours asynchronous remote lecture activity, interactive mode
24h of in person mandatory field activities (3 days, Campus abroad) (Attendance of field activities is mandatory)

One 2-hours asynchronous remote lecture activity, delivered didactic
One 2-hours synchronous remote lecture activity interactive mode

Textbook and teaching resource

Slides and self-assessment test on the e-learning page of the course

Semester

Second semester

Assessment method

The self-assessment test following the pre-field work laboratory, will be mandatory and it will contribute to the final score of the module by adding (or subtracting) up to 2 points. It will consists of thirty questions. The questions will be related to the content of the pre-field work activity. The aim of the test will be essentialy to verify the basic understanding of the principles of the geological approach to environmental monitoring.

During field activities the student will be required to keep a notebook over which the details of the activities, of the sampling and of the sampling protocols will be noted. At the end of the field activity the notebook will be evaluated with a score from 0 to 30. This part will be used to evaluate the degree of partecipation of the students to field activities. Their ability to correlate and organize the various information provided during the field activity will be also evaluated

After the post-field work activities, the students will be divided into groups and will present their data. The presentation will be analyzed and reviewed. The students will then have to once again present their data and then they will be evaluated with a score from 0 to 30. This latter test will be used to 1) asses the ability of the student to correlate the infomation and explain them clearly using the right terminology 2) the ability of the students to elaborate and display data and 3) the ability to understand corrections and apply fixes to a technical report.

The final mark of the exam will be based on the average of the field notebook and of the final report (plus 2 points for the self assement test, i.e. the max is 32= 30 cum laude)

Office hours

Upon appointment by e-mail to the professors

Sustainable Development Goals

LIFE BELOW WATER