UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Bio-Ecology Lab

2627-2-F7504Q025-F7504Q02501

Aims

The overall aim of the multidisciplinary lab is to transfer the theoretical knowledge acquired into practical research activities on the field aimed at monitoring and investigating different Mediterranean marine habitats and key ecosystems with a multidisciplinary approach combining the analysis of both living and dead assemblages with the assessment of abiotic parameters controlling the distribution of the organism.
In particular, the aim of the Bio-Ecology lab is to transfer the theoretical knowledge acquired into practical research activities in the field. In detail, this module aim at equipping students with the practical skills and fieldwork experience necessary to understand, assess, and manage marine ecosystems, in particular those of the Mediterranean sea, in order to foster the ability to conduct independent research and contribute to the conservation and sustainable management of marine resources.
The students should become able to understand and perform technical sampling activities related to the biodiveristy and distribution of marine organisms as well as read technical data related to them (DdD1). The course activities should provide the students with the capacity to draft experimental protocols to assess the status of the marine orgsnisms, both benthonic and nectonic, 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 ecological point of view, a marine environment (DdD3). The final oral test will also aim at strengthening their communication skills (DdD4) and their ability to autonomously elaborate the data (DdD5).

Contents

Study the structure and function of different Mediterranean marine habitats and key ecosystems; investigate the interactions between marine organisms and their environment; gain hands-on experience with various marine survey methods and learn to use specialized equipment for biological sampling; conduct analysis of biological samples to identify species and assess ecological health; examine the impact of human activities on marine ecosystems, such as pollution, overfishing, and climate change; participate in conservation and monitoring projects to gain practical experience in ecosystem management; work in teams to conduct research projects; analyse scientific data and present and discuss results on fieldwork findings.

Detailed program

Interactive teaching (LEEL, asynchronous remote lectures by videoconferences; 1 CFU, 7 h, DE):

1. General introduction to the Mediterranean marine ecosystem and habitat characterization.
2. Zoobenthic communities of the Mediterranean Sea with particular focus on the most ecologically relevant organisms.
3. Fitobenthic communities (macroalgal and seagrass) of the Mediterranean Sea.
4. Fish communities of the Mediterranean Sea, and methods for their analysis.
5. Threats and impacts on the biocenoses of the Mediterranean Sea

Campus abroad (field activities, in person, interactive mode, 2 CFU, 24 h, DI):

1. Overview of the study area, both from a terrestrial and marine point of view.
2. Check of the aquatic and snorkeling skills.
3. Introduction to the long-term monitoring program of marine organisms (and in particular of the coralline alagaga Elissolandia elongata) of the LTER Ecological Network (http://www.lteritalia.it), Eastern Ligurian Sea site carried out in collaboration with ENEA researchers.
4. Underwater monitoring and sampling of coralline algae (ENEA project): data collection, taxa recognition through visual census and microscopic analysis.
5. Underwater qualitative and quantitative monitoring of zoobenthonic organisms: data and organism collection, taxa recognition through visual census and microscopic analysis; focus on protected species and/or species ecologically relevant.
6. Qualitative and quantitative visual census of fish fauna
7. Plancton collection and analysis.
8. Mussel farming visit and participation in ongoing analysis activities
9. Data analysis and result presentation

Prerequisites

- Basic knowledge of zoology, ecology and marine biology (Marine Ecology and Biodiversity course is mandatory; Marine Invertebrate Zoology and Marine Botany courses are recommended)
- Regarding 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.
  Attendance of field activities is mandatory.
- For field activities it is reccomended to have underwater slate or diving notebook, snorkeling equipment (wetsuit, mask, snorkel, fins), field guide of the Mediterranean flora and fauna, underwater camera, personal laptop

Teaching form

- Asynchronous remote lectures by videoconferences; 1 CFU, 7 h, DE
- 24h of in person mandatory field activities (3 days, Campus abroad), interactive mode 2 CFU

Textbook and teaching resource

Slides of the lectures on the e-learning page of the course

Semester

Second semester

Assessment method

An oral exam will be carried out regarding the lessons held during the interactive teaching phase, during which the student must demonstrate that he/she has acquired the basic knowledge illustrated during the theoretical part the course. The student will be evaluated with a score from 0 to 30.
In addition, during the result discussion of the practical activities conducted abroad, students will be divided into groups and will present their data. The presentation will be analyzed and evaluated with a score from 0 to 30. The average of the two scores will represent the final exam score of the module.

Office hours

Upon appointment by email to the professor

Sustainable Development Goals

LIFE BELOW WATER