UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Fundamentals of Marine Biology

2627-1-F7504Q003

Aims

This course examines different biological and ecological aspects and processes of ocean ecosystems. Topics include the distribution, abundance, life habits and interactions of marine organisms characterizing the main zones and the different systems of the marine environment. The impact of multiple stressors and the problems affecting the marine habitats are also discussed.

1. Knowledge and understanding skills: Participants will gain knowledge of the key and in-depth concepts of marine biology, including definitions, spatial and temporal patterns, and the biological description of major marine environments.
2. Ability to apply knowledge and understanding: Participants will be able to apply the acquired knowledge to case studies in marine biology, thanks to their understanding of key concepts and analysis of issues related to the marine environment.
3. Independent judgment skills: Participants will be able to independently identify relevant issues and the most effective methodologies for studying, characterizing, and conserving marine environments
4. Communication skills: Participants will be able to express themselves clearly and in a scientifically accurate manner on topics related to marine biology, also through the analysis of current case studies.
5. Learning skills: Participants will be able to independently deepen their understanding of topics related to marine biology and integrate the acquired knowledge with future courses on the diversity, ecology, and conservation of the marine environment.

Contents

Processes of marine organisms, marine systems and habitats, functioning of marine ecosystems, case studies

Detailed program

Introduction to the course

What is marine biology and why it matters; history of marine biology; the scientific method

The marine environment

World oceans; structure of the ocean floor; chemical and physical properties of seawater; ocean circulation; life in a fluid medium; primary and secondary production

Classification and characteristics of the marine environments

General classification of marine environments; benthic life habits; benthic environments: tidelands (rocky shores, soft-substratum shores, marshes, mangroves, estuaries); sea grass beds, seaweed and kelp forests, rocky reefs, coral reefs; continental shelf seabed; deep sea; polar regions; pelagic environments and pelagic life habits

Introduction to impacts

Fisheries and aquaculture; pollution and climate change; conservation

Present and future of marine biology

Main recent lines of research in marine biology

Seminars

Tutorials
The tutorials complement the Fundamentals of Marine Biology course by providing hands-on, interactive learning experiences. Students will engage in various activities, including case studies, seminars by international professionals, and group presentations, to deepen their understanding of marine science concepts and develop practical skills.

Tutorial Objectives:

- Enhance research and analytical skills through case studies.
- Gain insights from leading international marine science professionals.
- Develop collaboration and presentation skills through group activities.

Prerequisites

None

Teaching form

Lessons (4 credits) + Tutorials (2 credits)

All lessons will be in presence and will include 100% of delivered didactics (14 two-hour lectures), through frontal lectures and seminars.

All tutorials will be in presence and will include: 50% of delivered didactics (6 two-hour lectures), through seminars; 50% of interactive teaching (6 two-hour lectures), through case studies and group presentation and discussion.

Textbook and teaching resource

PowerPoint slides

Marine Biology: Function, Biodiversity, Ecology (3°edition). Jeffrey S. Levinton, Oxford University Press

Marine Ecology: Processes, Systems, and Impacts (2° edition). Michel J. Kaiser et al., Oxford University Press

Marine Biology (10° edition). Peter Castro & Michael E. Huber, McGrow Hill Higher Education

Semester

First semester

Assessment method

Oral examination on the topics treated during lessons and tutorials
No midterm exams are scheduled

During the oral exam, the understanding of the topics covered in class will be assessed through both general and specific questions, as well as the ability to make connections between concepts, think critically, and use appropriate scientific language.

Mark range: 18-30/30

Office hours

By appointment by sending an email to the lecturer (davide.maggioni@unimib.it)

Sustainable Development Goals

LIFE BELOW WATER