UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Fondamenti di Geografia Fisica Marina

2324-1-F7401Q099

Aims

Provide knowledge on the processes that form and shape coastal and submarine landforms, controlling their short-term and llong-term evolution through time. Provide a basic knowledge about seafloor mapping techniques and methods for submarine geomorphological mapping.

Contents

- Data and methods in submarine Geomorphology. Seafloor mapping, seafloor sampling and visual surveys: tools and survey design.
- Coastal landforms and processes. Beach and nearshore systems, coastal sand dunes, delta and estuaries, barrier systems. Rocky coasts and coral reefs.
- Submarine landforms and processes. Drivers of seafloor geomorphic change in submarine environment (tectonic, sedimentology, oceanography and biology). Continental shelf landforms, submarine landslides, submarine canyons and gullies, channel and fans, contouritic drifts, oceanic islands and seamounts, mid-ocean ridges, fluid-escape features, abyssal hills and plains, trenches, bioconstructions

Detailed program

Frontal lectures (4 CFU - 28 hours):

Introduction: Marine Phyisical Geography, Oceanography and Marine Geomorphology.

Research methods in submarine geomorphology. Seafloor mapping, seafloor sampling and visual surveys: tools and survey design

Geomorphology of the ocean seafloor. A global map of the ocean seafloor and classification of large-scale submarine landforms (continetal margins, oceanic islands and seamounts, mid-ocean ridges, abyssal hills and plains, trenches).

Drivers of seafloor geomorhpic changes in submarine environments. Winds and ocean circulation (effects on coastal and submarine landforms). Waves and tides. Sea-level changes (geomorphological indicators). Submarine sedimentary processes, environments and landforms: Continental shelf landforms, Contourites, sediment waves and bedforms, resedimentation processes, submarine slides, submarine canyons and gullies, channel and fans. fluid escape features.

Coastal systems: terminolgies and classification of coastal systems. Delta, estuaries and beaches. Rocky coasts and coral reefs.

Laboratory lectures (2 CFU - 24 hours):
Submarine geomorphological mapping: implementation of acoustic remote data in Geographical Information Systems (GIS)

Laboratory lectures (2 CFU - 24 hours):
Practical activities on marine geophysical equipments and seafloor imaging: single-beam echosounder, multi-beam echosounder, and remotely underwater vehicles.
Practical exercises on the interpretation of seismic reflection data

Prerequisites

Fundamentals of Mathematics, Physics and Chemistry.

Teaching form

- Lessons: 4 credits

- Tutorials: 2 credits

- Tutorials: 2 credits

Textbook and teaching resource

Alan P. Trujillo & Harold V. Thurman. Essential of Oceanography. Pearson

Micallef A., Krastel S., Savini A. Submarine Geomorphology. Springer
D.A.V. Stow, H.G. Reading, Collinson J.D – Deep Seas. In: H.G. Reading, Sedimentary environment: Processes, Facies and Stratigraphy (Cap. 10). Blackwell Science.
NC Mithcell. Submarine Geomorphology. Elsevier

G. Masselink & Hughes M.G. An introduction to coastal processes and geomorphology. Cambridge

A selection of scientific journal articles will be provided by the teachers.

Semester

First semester

Assessment method

Written and oral examination.
The written test will consist of a questionnaire of 60 questions with multiple-choice answers focusing on the topics covered during the oral lessons.
The oral test will consist of a short discussion on a thematic map or a seismic profile or a graphic elaboration of data acquired by means of acoustic geophysical instrumentation, to test the acquired knowledge on marine exploration and seafloor mapping techniques.
Both tests will be held on the same day.

Office hours

To make an appointment, please contact the teachers by e-mail:

alessandra.savini@unimib.it

Sustainable Development Goals

INDUSTRY, INNOVATION AND INFRASTRUCTURE | LIFE BELOW WATER