



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Introduction To Ocean Geography

2526-3-E3401Q053

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#### Aims

To acquire the knowledge of the main biotic and abiotic components in marine systems to understand the functioning of the planet and to acquire an adequate knowledge in the main techniques of geological-geomorphological prospecting at sea (DD1). Such knowledge will result in the capacity to read bathymetric and bathymorphological maps and to interpret marine sedimentary sequences in terms of paleoenvironments (DD2). The interlink among the various fields of knowledge, promoted by the teachers, will require the development of critical thinking, that will be assessed during the oral examination (DD3), along with the capacity to use an appropriate scientific language (DD5).

#### Contents

Introduction to the marine environment in its various components.

Main physical, chemical and biological characteristics of water masses; techniques of observation, measurement and sampling of water masses.

Marine sediments: nature, composition and origin of terrigenous, volcanoclastic, neritic, pelagic, hydrothermal and authigenic sediments.

The seafloor: physiography, geomorphology and processes: analysis and sampling techniques.

#### Detailed program

Physical, chemical and biological characteristics of the water masses: insolation, temperature, salinity, density,

horizontal and vertical circulation, waves, tides, dissolved gases (O<sub>2</sub> and CO<sub>2</sub>), nutrients, primary production. Organic matter in the marine environment and the C cycle. Measuring and sampling the water column and assessing biogeochemical fluxes (CTDs, rosettes with sampling bottles, sediment traps).

Nature and origin of marine sediments: lithogenic, volcanogenic, neritic, pelagic, hydrothermal, authigenic sediments.

Seafloor sampling techniques: grabs, box-corers, multi-corers, gravity and piston corers; ocean drilling for scientific research.

Geology and oceanographic explorations. Fundamentals of submarine geomorphology. Marine physiographic provinces and their large morpho-structural units. Continental margins and ocean basins. Drivers of seafloor and coastal geomorphic changes.

Technologies of observation and sampling of the marine system. Ship positioning and navigation. Acoustic seafloor mapping.

Bases of paleoceanography

## **Prerequisites**

All exams of the first year and the foreign language proficiency test

## **Teaching form**

24 two-hour Lectures in person, Delivered Didactics (6 ETCS, 48 hours)

## **Textbook and teaching resource**

Recommended text: Trujillo and Thurman, 2011. Essentials of Oceanography. 10th Edition. Prentice Hall

Slides of lessons provided by the teacher on e-learning

## **Semester**

second semester

## **Assessment method**

Four self-assessment tests (multiple choice and true/false quiz) on the different themes explained in classes, to be done on e-learning. The tests will be available throughout the semester and must be passed with a minimum

grade of 24 at least one day before the oral examination. Students are not allowed to proceed to the oral examination without successfully completing the self-assessment tests. The tests are constructed to assess the theoretical knowledge acquired by the students and can be used by the students to rehearse for the oral exam: the system will keep only the highest grade obtained by the students in multiple attempts.

Oral examination: 2 open questions related to the themes explained during classes. During the oral exam, the teachers will evaluate the acquired knowledge and the acquired capacities in terms of appropriate language and mastery of the themes.

## **Office hours**

Any time, upon request by e-mail followed by confirmation by the professor

## **Sustainable Development Goals**

AFFORDABLE AND CLEAN ENERGY | LIFE BELOW WATER

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