

## COURSE SYLLABUS

### **Geobiology**

**2425-1-F7502Q013**

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#### **Aims**

To provide the main concepts for understanding the interactions and the coevolution of biosphere, hydrosphere and geosphere.

To acquire the conceptual and operative knowledge for the study and interpretation of the modern marine environments and their reconstruction in the geological record, including the recent past.

#### **Contents**

Coevolution of geosphere and biosphere, extinctions, principles of biomineralization, biogenic carbonates, bioconstruction and habitat engineers, sediments and benthos, benthic zonation, introductory biogeochemistry and proxy data in natural archives, past and ongoing global changes

#### **Detailed program**

Lessons: The benthos in the geologic history. Extinctions and major events in the Earth history. The appearance of organic calcification and the biomineralization. Photosynthesis and chemosynthesis. Ocean chemistry and biomineralization. The evolution of biogenic builders in the Phanerozoic. The modern bioconstruction: structures, biological associations, ecological factors of control and distribution. Habitat engineers. Diagnosis, significance and distribution of the major benthic associations and related sediments. Benthic zonation in the present-day oceans as key to understand the geological record. The benthos in the geomorphology and evolution of carbonate platforms. Biocoenoses, communities, associations and interpretation of thanatocoenoses and fossil assemblages on the basis of the biostratinomic processes. The chemical environment at the water-sediment interface. Identification and interpretation of the most important ichnofacies. Biogeochemical proxies and natural archives. The ongoing global

change and the geobiological feed-back.

Practical classes: Geobiological analyses of biogenic remains and embedding sediments, in the framework of the "Carbonate factories" and marine benthic bionomics. Observations under Scanning Electron Microscope (SEM) of the commonest shell/skeletal structures.

Lab activities (for Geology students): carbonate rocks, classifications, components, processes and environments of formation. Identification of components in thin section under Optical microscope..

## **Prerequisites**

Fundamentals of Marine Biology, Ecology and Physical geography. General Palaeontology is also suggested

## **Teaching form**

- 17 two-hours + 1 hour lectures, in person, Delivered didactics (35 hours, 5 cfu)
- 4 three-hours practical classes, in person, Interactive Teaching. Mandatory attendance for at least 2/3 of the total hours to access the exam.
- Geology students only: 8 three-hours lab activities, in person, Interactive Teaching. Mandatory attendance for at least 2/3 of the total hours of lab + practicals to access the exam.

## **Textbook and teaching resource**

The lectures and some suggested readings will be provided by the teacher.

Useful books: Fundamentals of Geobiology, Knoll et al (Eds) ISBN 978-1-4051-8752-7

## **Semester**

First semester

## **Assessment method**

Written + Oral examination

A written test of 20 questions will test the understanding of the main concepts presented during the course. A supplementary preliminary question, exclusively for the students of Geological Sciences who select this course,

is aimed at assessing their knowledge of the main subdivision of the geological time. A negative result for this first question prevents the continuation of the exam (for geologists only).

The final mark is composed by the written/oral marks plus up to 1 point for the practicals. If the compulsory attendance for at least 2/3 of the laboratory hours is not respected, it will not be possible to take the oral exam.

Marks are given as n/30. Minimum positive value is 18/30

## **Office hours**

To make an appointment, please contact me by mail: [daniela.basso@unimib.it](mailto:daniela.basso@unimib.it)

## **Sustainable Development Goals**

QUALITY EDUCATION | LIFE BELOW WATER

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