UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Paleoceanography and Paleoclimatology

2122-2-F7502Q020

Aims

Understanding the natural variability in the climate system; knowledge of climatic variations and their causes at different time scales; study of proxies in different archives; knowledge of the main oceanographic processes in the present and in the past.

Contents

Bases of Paleoceanography and Paleoclimatology: climate system, chronology, proxies. Climatic variability and climate variations: timescales of changes. Paleoceanographic variations, as reconstructed through proxy data.

Detailed program

Lessons:

The climate system: components, inter-relations, annual and inter-annual variability.

Climatic variations: time scales and control mechanisms at the global scale; the anthropogenic impact.

Chronology: main dating methods in paleoclimatology and paleoceanography. Radiocarbon as a dating method and paleoclimatic-paleoceanographic proxy.

Paleoclimatic proxies: examples and applications in the marine, ice and terrestrial record.

Climatic evolution in the geologic past: early Earth climate states and climate evolution; greenhouse and icehouse states; the Cenozoic mid-house; climate variations and Milankovitch cycles; millennial, centennial and decadal-scale variability in the recent past.

Paleoceanographic applications; climate and sea level; paleocirculation and paleoproductivity; global and Mediterranean (sapropel) anoxic events; ocean acidification in the present-day and in the paleo-record.

Tutorials:

Case studies: analysis, processing and interpretation of paleoclimatic and paleoceanographic data. Analysis and discussion on paleoclimatic and paleoceanographic reconstructions from the recent scientific literature.

Prerequisites

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Teaching form

Lessons

Tutorials

During the COVID-19 restrictions the lessons will be recorded and available online, with some live events that will be planned and communicated on the e-learning page of the course.

Textbook and teaching resource

Bradley - Quaternary Paleoclimatology

Slides provided by the professor

Semester

First semester

Assessment method

Oral examination: 3 questions related to the themes addressed in class, of which: 2 questions to assess the knowledge on proxies and the mechanisms and time scales of changes; 1 question related to the changes occurred within one specific time frame, among those shown in class and in the slides, drawing a graph.

Written report on the laboratory activities

Grades in /30.

During the Covid-19 restrictions the oral exams will be exclusively through the WebEx platform. A public link will be posted on the e-learning page of the course for the access of virtual public.

Office hours

Monday and Thursday: 9:00 AM - 12:00 AM upon appointment by e-mail