UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Paleoceanography and Paleoclimatology

2223-2-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

Textbook and teaching resource

Bradley - Quaternary Paleoclimatology

Slides provided by the professor through the e-learning page

Semester

First semester

Assessment method

Group oral presentationat the end of the lab activities, to check the acquired knowledge, the ability to chose the most important data related to the case study and the ability to communicate with a specific scientific language, proper for the course.

Personal written report on the activities done during the lab, in order to assess the acquired knowledge, tha caèacity to analyse the considered dataset and the ability to interpret, synthetise and communicate in a written text the results of the case study. The report must be submitted at least 3 days before the oral examination.

The evaluation of the presentation and of the report will count for 1/6 of the final grade

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. During the exam, the teacher will evaluate the knowledge of the important information related to the course and the capacity to explain clearly and with an appropriate terminology the themes of the course.

The evaluation of the oral examination will count for 5/6 of the final grade

Grades in /30.

Office hours

Upon appointment by e-mail

Sustainable Development Goals

LIFE BELOW WATER