UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Climate Change

2223-2-F7501Q084

Aims

Understanding the physical bases of climate changes and their impacts on natural and anthropic systems, on different spatial and temporal scales.

At the end of the course students will have:

KNOWLEDGE AND UNDERSTANDING. Acquire an introductory knowledge of climate system physical components and their natural and anthropic perturbations

APPLYING KNOWLEDGE AND UNDERSTANDING. Acquire a specific competence and apply technical knowledge physical-chemical aspects related to climate change.

MAKING JUDGEMENTS. Learn to critically think about the complex interactions between physical and socio-economics aspects of climate change, focussing on atmosphere.

COMMUNICATION SKILLS. Demonstrate the acquisition of a correct vocabulary and to know how to expose the essential contents of the subject in a clear and mature way.

LEARNING ABILITY. Be able to tackle the study of advanced textbooks, technical reports and scientific articles, mostly in English, produced by research centers, governments and international organizations, related to climate phenomena and to mitigation and adaptation policies.

Contents

Physical bases of climate changes. Feedbacks in the Earth system. Vulnerability, impacts, adaptation and mitigation. Climate change science in the panorama of international treaties on climate.

Detailed program

The aim of this course is to provide tools for understanding the causes and analyzing the effects of climate change at global and regional scales. After the acquisition of specific scientific basis, the impacts of climate change on natural and manmade systems are explored, along with the concepts of ethical, economic and energy issues related to climate change.

The first part of the course (Climate Change), by means of frontal lessons, is dedicated to the scientific bases of climate change, as well as to impacts, adaptation and vulnerability. In this module, students will learn the basics of the climate system of the Earth and the greenhouse effect, evaluate the information obtained, and draw conclusions about the causes of climate change. The topics include the analysis of different components of the climate system (atmosphere, ocean, land surface, cryosphere, biosphere), feedbacks in the climate system, the greenhouse effects, global energy budget, the global carbon cycle, aerosols, as well as impacts and adaptations concerning ecosystems, the hydrological cycle, and sea level.

The Climate Change Laboratory offers the possibility to focus on paleoclimate changes deduced from natural archives of climate history, in particular on ice cores. Lab activities will be partly carried out at the EUROCOLD Laboratory of DISAT (European Cold Laboratory Facility).

Prerequisites

Atmospheric Chemistry and Atmospheric Physics (reccomended)

Teaching form

Frontal lessons (Climate Change) : 5 CFU (40 hours) - Prof. Valter Maggi
Climate Change Laboratory : 1 CFU (10 hours) - Prof. Barbara Delmonte

Textbook and teaching resource

Check on web site: http://elearning.unimib.it/

Semester

Second semester

Assessment method

Oral exam composed by two parts, for lessons and laboratory respectively.

The final mark corresponds to the weighted average of the two partial marks.

Office hours

By appointment:
valter.maggi (at) unimib.it

For the Laboratory part:
barbara.delmonte (at) unimib.it

Sustainable Development Goals

CLIMATE ACTION