UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Climate Change Impacts On Geohazards

2627-2-F7402Q021

Aims

The objective of the course is to provide knowledge of ongoing climate change and its impact on natural hazards.

Knowledge and Understanding
To know and understand the main processes governing the climate system and its variability from a geological and Earth system perspective. To understand observed and projected changes in key climate variables and their relationship with natural hazard processes. To understand the physical mechanisms linking climate change to extreme events and major hydro-geomorphological hazards.

Applying Knowledge and Understanding
To be able to analyse and interpret climate and hazard-related data to identify trends, variability, and significant changes. To be able to relate climate processes to the occurrence and evolution of natural hazards in different environmental contexts. To be able to integrate climate, geological, and hydrological information to assess hazard behaviour under current and future conditions.

Making Judgements
To be able to critically evaluate the relative role of climate, environmental, and geological factors in controlling natural hazards. To be able to assess the reliability and limitations of data, methods, and projections used in climate-hazard analysis. To be able to make reasoned judgements about future hazard scenarios under climate change, including uncertainty.

Communication Skills

To be able to clearly describe climate processes and hazard relationships using appropriate scientific language. To be able to synthesise and present results using structured written, graphical, and oral formats. To be able to communicate uncertainty and limitations in a transparent and effective way.

Learning Skills
To be able to apply acquired knowledge to new and unfamiliar case studies. To be able to independently access

and use scientific information and datasets. To be able to integrate concepts from multiple Earth science disciplines in a learning context.

Contents

The course includes an introduction to climate change, in particular past trends and future projections of the most relevant weather-climate variables for natural hazards. Furthermore, it analyses climate drivers and the mechanisms of the main natural hazards (floods, landslides, storms, avalanches) in order to study their evolution.

Detailed program

1. Introduction to the problem of climate change from a geological perspective
2. Analysis of trends over the past century of some the most important climate variables relevant to natural hazards
3. Variations in the frequency and intensity of extreme events and climate teleconnections
4. Impact of climate change on landslides (drivers, mechanisms, recent trends, and future predictions)
5. Impact of climate change on floods (drivers, mechanisms, recent trends, and future predictions)
6. Impact of climate change on avalanches (drivers, mechanisms, recent trends, and future predictions)
7. Impact of climate change on water availability (drivers, mechanisms, recent trends and future predictions)
8. Impact of climate change on wildfires and droughts.

Prerequisites

The Geologic Hazard Assessment course is recommended.

Teaching form

interactive teaching and exercises (42 hours)
research and presentation preparation (8 hours)

Textbook and teaching resource

Lecture notes, supplementary materials, and datasets provided by the Teacher.

Semester

2nd semester

Assessment method

Students will be required to select a topic covered during the course, conduct independent research on the chosen subject, prepare a written presentation (e.g., slides), and present their work to the class. The assessment will evaluate the students’ ability to critically analyse the selected topic, engage with relevant academic literature, and effectively communicate their findings.

There are no *in itinere* tests and no written exam.
The final grade is awarded in thirtieths.

Office hours

The Teacher receives on appointment, to be scheduled by e-mail.

Sustainable Development Goals

QUALITY EDUCATION | CLIMATE ACTION