UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Quantitative Georisk Analysis

2526-1-F7402Q009

Aims

The course aim at providing concepts and methodologies for the analysis, the evaluation and the mitigation of geological risks.

Contents

Definition of hazard, vulnerability and risk. Description and assessment of flood risk, seismic risk, landslide risck and snow avalanche risk. Introduction on coastal risks and volcani risk.

Detailed program

Risk definition, risk assessment, risk management. Descriptors of Individual Risk and Societal risk. FN curves. Risk acceptability.

Flood risk: hydrological processes contribution to flood hydrograph, geological and environmental factors influencing the hydrograph, basics of fluvial hydraulics. Analysis of Frequency Discharge relationships, flow modelling and flood risk zonation. Vulnerability curves. Monitoring and mitigation techniques.

Landslide risk: basics of slope stability and factors influencing slope stability. Analysis of return period and magnitude frequency analysis. Susceptibility analysis. Runout modelling. Vulnerability curves. Monitoring and mitigation techniques.

Seismic risk: descriptors of seismic hazard and elastic response spectrum. Regional seismic analysis with probabilistic approach (PSHA). Hazard curve. Site effects and co-seismic effects. Basics of technical design codes

and characterization of seismic action. Fragility curves. Monitoring and mitigation techniques.

Snow avalanche risk: basics of snow science. Processes of onset, transport and accumulation of snow avalanches. Analysis of return time and magnitude intensity relationship. Analysis of AINEVA Guidelines for snow avalanche hazard zonation. Monitoring and mitigation techniques.

Introduction to other risks: soil erosion, coast erosion, volcanic activity, tsunamis, coast floods.

Prerequisites

None

Teaching form

The course is taught in English and divided into:

17 two-hour Lectures in person(+ 1 Lecture of 3 hours), Delivered Didactics (5 ECTS, 35 hours)
6 two-hour lab activities, in person, Interactive Teaching (1 ECTS, 12 hours)

Textbook and teaching resource

Course notes and power-point slides provided by the teacher. Scientific papers. National and international guidelines on risk assessment.

Semester

Spring semester

Assessment method

Oral examination.

Office hours

From Monday to Friday, 14 pm - 16 pm

Sustainable Development Goals

SUSTAINABLE CITIES AND COMMUNITIES | CLIMATE ACTION