



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Applied Seismology

2223-1-F7401Q107

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#### Aims

Intermediate knowledge of seismology and applied seismology; use of seismological data and seismic catalogues for structural geology and geodynamics studies; fundamentals of seismic hazard and evaluation of site effects targeted to environmental planning and infrastructure design.

#### Contents

a) fundamentals of seismology; b) introduction to the seismic source; c) principles of attenuation of elastic waves and ground motion; d) shaking parameters, response spectrum, ground motion prediction equations; e) site effects; f) fundamentals of seismic hazard; g) seismic microzonation; h) introduction to the Italian seismic code (sections of interest to geologists).

#### Detailed program

- Fundamentals of seismology: cause of earthquakes; seismic waves; earthquake location; magnitude estimation; instrumental seismic; monitoring networks; introduction to seismic instruments.
- Seismic source: point and extended source; seismic moment; introduction to the Fourier transform; Brune source spectrum.
- Attenuation of elastic waves: geometric and anelastic attenuation;
- Shaking parameters: peak and duration parameters, response spectrum, ground motion prediction equations.

- Seismic hazard: macroseismic catalogue, magnitude-frequency power, catalogue completeness, concept of deterministic and probabilistic seismic hazard, Italian seismic hazard.
- Seismic microzonation: basic concepts, first, second and third level of microzonation, examples of seismic microzonation for recent earthquakes.
- Introduction to the Italian seismic code: design spectra, site effects, selection of accelerograms compatible with response spectra.

## **Prerequisites**

None

## **Teaching form**

21 hours (lessons) and 36 hours (practical exercises)

## **Textbook and teaching resource**

slides, video, recommended textbook: Faccioli E, Paolucci R, Elementi di sismologia applicata all'ingegneria, Pitagora Editrice Bologna

## **Semester**

October 2022 - January 2023

## **Assessment method**

Oral examination

## **Office hours**

By appointment 9:30 -11:30 (at INGV department via Corti 12, Milano)

## **Sustainable Development Goals**

