



### LANDSLIDES HAZARD AND RISK

<b>Anno immatricolazione</b>	2020/2021
<b>Anno offerta</b>	2020/2021
<b>Normativa</b>	DM270
<b>SSD</b>	GEO/05 (GEOLOGIA APPLICATA)
<b>Dipartimento</b>	DIPARTIMENTO DI INGEGNERIA CIVILE E ARCHITETTURA
<b>Corso di studio</b>	CIVIL ENGINEERING FOR MITIGATION OF RISK FROM NATURAL HAZARDS
<b>Curriculum</b>	Hydrogeological risk assessment and mitigation
<b>Anno di corso</b>	1°
<b>Periodo didattico</b>	Secondo Semestre (08/03/2021 - 30/03/2021)
<b>Crediti</b>	6
<b>Ore</b>	58 ore di attività frontale
<b>Lingua insegnamento</b>	English
<b>Tipo esame</b>	SCRITTO
<b>Docente</b>	MEISINA CLAUDIA (titolare) - 3 CFU BORDONI MASSIMILIANO - 3 CFU
<b>Prerequisiti</b>	Basic knowledge of engineering geology.
<b>Obiettivi formativi</b>	Scope of the course is to introduce the student to recognize and characterize different types of slope instabilities and to be able to use tools for the landslide hazard and risk assessment, to select techniques for monitoring and mitigation of landslide risk.
<b>Programma e contenuti</b>	Landslide terminologies and types, classifications. Landslide dynamics. Predisposing and triggering factors, landslide occurrence as a consequence of land use and climate changes. Methodologies of landslide investigation and mapping, landslide inventories. Methods for landslide susceptibility and hazard assessment (initiation and run out): knowledge –driven, data-driven and physically based methods. Evaluation of the performance of landslide zonation map. Landslide

monitoring and early warning: ground-based and remote surface displacements measurement techniques, monitoring of hydro-meteorological variables. Rainfall threshold for landslide prediction. Landslide mitigation: structural and non-structural protection. Lesson learnt from some case histories.

Landslide Risk analysis, assessment and management: from Qualitative to Quantitative Risk Analysis , human induced landslides and the role of human activities in relation to landslides, landslide risk assessment and sustainable development: methods and tools for land-planning, risk management framework, resilience assessment, case histories.

The course is integrated and complemented by computer lab exercises concerning landslide hazard and risk assessment and field trip to landslides in the Alps and in the Apennines.

#### Metodi didattici

The course consists of lectures to illustrate the theory and tutorial sessions where the emphasis is on applications and problem solving. Each subject is illustrated with the support of experimental and observational evidences and well-documented case histories concerning landslide hazard and risks drawn from the experience of the instructors.

#### Testi di riferimento

? Lynn M. Highland, United States Geological Survey, and Peter Bobrowsky, Geological Survey of Canada (2008). The Landslide Handbook—A Guide to Understanding Landslides. USGS Circular 1325. Reference textbook.

? Landslides: Investigation and Mitigation : Special Report 247 (Special Report (National Research Council (U S) Transportation Research Board)) by A. Keith Turner (Editor), Robert L. Schuster (Editor). Reference textbook.

? Thomas Glade, Malcolm Anderson, Michael J. Crozier (2005). Landslide Hazard and Risk. John Wiley & Sons, 15 apr 2005 - 802 pagine. Reference textbook.

? Course notes, scientific articles and other material will be provided during the course.

#### Modalità verifica apprendimento

Assignments will be handed over and graded during the course. The final examination will consist of a 3 hours, written test. The final-exam format is closed-book. Grading: 40% assignments, 60% final exam.

#### Altre informazioni

#### Obiettivi Agenda 2030 per lo sviluppo sostenibile

[\\$lbl legenda sviluppo sostenibile](#)