UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Advanced Numerical Modelling Towards Digital Twins for Geomaterials

2526-1-124R-SCGA.23

Title

Advanced Numerical Modelling Towards Digital Twins for Geomaterials

Teacher(s)

Giovanni Battista Crosta; Riccardo Castellanza; Bianca Di Blasio

Language

English

Short description

This course provides a general overview of advanced numerical modelling towards digital twins for geomaterials. Topics: (A) Advanced numerical modelling (finite elements based) for slope stability and underground geostructures; numerical modelling of geotechnical problems; PDE system for geotechnical problems and geostructures; 3D FEM coupled problems: chemo-thermo-hydro-mechanical modelling; case studies; new trends in numerical modelling in geomechanics. (B) Modelling of landslides and debris flow: simple modelling (point-like, slabs) to illustrate integration routines, Lagrangian models (BING), and Eulerian models of debris flows with CFD

finite volume software. (C) Geoenergy and geomechanics: shallow geothermal systems, thermal potential of shallow aquifers, conduction and advection; reservoir fluid characterization, convection cells in porous media; physical properties and testing methods; storage of CO2 and other fluids at depth; case studies of heat flow transport.

Evaluation: YES

CFU / Hours

36 Hours - 3 CFU (Lecture)

Teaching period

II Semester

Sustainable Development Goals