UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Basic Engineering Geology

2324-3-E3401Q042

Aims

Students will learn basic knowledge about engineering geology, soil and rock mechanics and application of principles to the analysis of geomaterials

Aim of the course is to provide basic and advanced knowledge concerning: engineering geological problems under subaerial and subaqueous conditions; problems linked to engineering structures, mining and environmental engineering; the physical mechanical behaviour of soil, rock and rock masses and their characterization; direct and indirect in situ investigations; in situ stress state and its changes due to natural and anthropic action; seepage in porous media; soil and rock stability.

The student will be finally capable to understand how to apply engineering geological knowledge for solving geological and technical problems, for land use planning, construction of structures and infrastructures, modelling of physical and geological processes.

Contents

Theory: fields of interest; techniques and methods; engineering geological problems; hazard and risk concepts; geomaterials; principles of stress and deformation analysis; constitutive laws, time/deformation models; rheological models. Physical properties of soil and rock and their technical classifications. In situ stress in geological media and their changes. Water seepage and its role on in situ stress and soil/rock stability. Consolidation and settlements. Mechanical properties of soils: compressibility, shear strength, in different stress and drainage conditions. Mechanical properties of intact rocks and rock masses: resistance, deformability. Lateral earth pressure: elastic and plastic soil stability; ultimate bearing capacity. Soil and rock behaviour under dynamic conditions.

Lab exercises: physical and mechanical properties of soil and rock; in situ stresses; seepage, flow nets; consolidation and settlement; earth pressure and bearing capacity.

Detailed program

Prerequisites

A base-level knowledge in geology, physics, mathematics and mineralogy is requested

Teaching form

Lectures and lab activities

Textbook and teaching resource

All the material used for the lectures is made available

Semester

First Semester

Assessment method

Oral exam

Office hours

8.30 - 19.00

Sustainable Development Goals

LIFE ON LAND