1) Titolo dell'Insegnamento (previsto in inglese)

UNDERGROUND EXCAVATIONS: GEOLOGICAL ASPECTS, MONITORING AND RISK ANALYSIS RELATED TO THE GEOTECHNICAL DESIGN

(2) Titolare

Prof. Ing. Andrea SEGALINI

(3) Numero ore di lezione (e numero di CFU erogati)

12 (4 lezioni da 3 ore)

(4) Programma delle lezioni

LESSON 1

L1. 1.5h Main Geomechanical classifications
Description of the main classifications for the rock mass mechanical characterization to be used as base for design analyses

L1. 1.5h Elastic Isotrophic medium and stress state around a tunnel
Description and analysis of the stress modification around an underground excavation under different hypothesis.

LESSON 2

L2. 2.0h Characteristic lines method
Presentation and description of the characteristic lines method. Application of the methodology for the design of excavation reinforcements. Working hypotesis and application fields

L2. 1.0h Excavation wall stability: Analysis methods and examples
Limit equilibrium methods for the excavation wall stability analysis. Application fields.

LESSON 3

L3. 1.0h Excavation methods and reinforcement types
Traditional Excavations
Mechanized Excavations

L3. 1.0h Moniotring systems for underground excavation and structures
Description of the main monitoring systems used in the underground field

L3. 1.0h Risk analysis methods for underground works
Description of the Risk analysis methodology applied to the tunnels and underground constructions

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LESSON 4

L4. 3.0h Practical examples and excercises
Application of the characteristic lines method
Numerical anlaysis of underground excavations: procedure and hypothesis.
Finite element modeling (FEM) of an underground excavation. Reinforcement design and verification.

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(5) Final Test