



Dipartimento di Scienze e Tecnologie

ANNO ACCADEMICO 2017/2018

CORSO di STUDIO in Scienze e Tecnologie Geologiche
INSEGNAMENTO in Rilevamento ed esplorazioni geologico-tecniche (Survey and geo-technical explorations)

DOCENTE Prof. Francesco Fiorillo

Introduction: Definition; fields of application; means and methods; relationships with other disciplines. Organization of the course. Exam Mode.

Geological-technical survey and exploration in the context of applied geology problems: the design and preservation of constructions, the definition and mitigation of geological hazards, and the planning of the territory.

Large scale and detailed geological sections: stratimetry; reconstruction of geological limits.

Detection of cover deposits: Alluvial, colluvial, eluvial, debris, morene, pyroclastic deposits. Geo-technical surveys, including direct and indirect surveys, mapping and representation methods.

Introduction to Rock Mechanics. Discontinuity of rock mass: glossary and instrumentation. Orientation of discontinuities, spacing, persistence, compression strength, opening, filling, filtration, block size. Perforation material from boreholes. Plot of discontinuities: Schmidt net; construction of isodense diagrams and discontinuity nets. Failure criteria along discontinuous planes and rock mass classification systems: RMR, Q system. Kinematic analysis connected to one and two discontinuities. Markland method. Structurally complex soil and technical characterization; empirical method of Hoek & Brown. GSI Index (Geological Strength Index).

Exploration and underground monitoring techniques. Direct and indirect investigations. Static and dynamic cone penetrometric tests; correlation of test data with technical parameters (friction angle, cohesion, elastic modules). Site tests: load on plate, vane test, pumping and absorbing tests in well. Monitoring of displacements by inclinometric probes and extensometers. Main topographic techniques. Measurement of water pressure by means of piezometers. Design and planning of a geo-technical survey. Main roles of geo-technical surveys.

The detection of hydrological parameters. Detection and analysis of rain, discharge, detection of the main physical and chemical characteristics of water; statistical data processing. An overview of the hydrological models at the base of geo-technical and hydrogeological themes.

Underground Works: Main underground excavation methods and references to the relevant types of temporary and permanent support works.