MODELLO SCHEDA INSEGNAMENTO

Corso di L/LM/LMCU	**LM in Scienze e Tecnologie Geologiche**
Denominazione insegnamento:	**Rilevamento ed esplorazioni geologico-tecniche**
Numero di Crediti:	**6**
Semestre:	**I**
Docente Titolare:	**Francesco Fiorillo**
Dottorandi/assegnisti di ricerca che svolgono attività didattica a supporto del corso:	**Mauro Pagnozzi**
Orario di ricevimento:	**14:00-16:00, Martedì e Giovedì**
Indirizzo:	**via dei Mulini 59/A - Benevento**

PRESENTATION OF THE COURSE:

The course deals with surveying geological-technical data, describing the main methods in use. In addition, processing and presenting data are also described.

THE FORMATIVE OBJECTIVES

At the end of the course the student will acquire knowledge and skills in the following areas:

- is able to detect, treat and represent geological-technical data;
- it is capable of carrying out a geotechnical characterization of rocks, and can evaluate the stability of natural and artificial slopes in rock;
- knows the main underground geological exploration techniques, on-site tests, and the main instruments of instrumental monitoring.
- knows the main techniques for detecting and treating hydrological data;
- knows in depth the main geo-technical aspects related to the construction of civil engineering works and protection from natural hazards.

REQUIRED PRACTICES

No pre-teaching instruction is required, with the exception of those normally acquired during the three-year undergraduate course (mathematics, physics, geology, applied geology).

FREQUENCY OF LESSONS

The course rate is strongly recommended for frequent exercises and applications of the exposed methods.

CONTENTS OF THE COURSE

Large scale and detailed geological sections, with reference also to cover deposits of interest for geo-technical purposes.

Introduction to Rock Mechanics. Discontinuity survey of rock amass. Failure criteria along discontinuity plans and main geomechanical rock mass classification. Stability of rock mass along natural and cutting faces. Kinematic analysis connected to one and two discontinuities.

Detection of main hydrological parameters. Detection and analysis of rainfall, temperature, discharge data and their analyses.

Underground surveys and monitoring techniques. Boreholes perforation and water pressure measurements by piezometers. Main geotechnical tests on site. Monitoring of surficial and deep displacements by inclinometric probes and extensometers. Design and planning of a geo-technical survey.

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

DIDACTIC METHODS

The course is divided into theoretical frontal lessons, group and individual exercises, also using PC. There are also 1 or 2 field trip for site-based application of some of methods shown.
All the activities carried out allow the student to be trained geo-technically; the short report (written-graphic) provided before the final oral test is an important self-test of acquired skills.

REFERENCE TEXTS

Hoek E. & Bray J.W. (1981) – Rock slope engineering – The Institute of Mining and Metallurgy ed., London.
Ippolito F., Nicotera P., Lucini P., Civita M., De Riso R. (1987) – Geologia tecnica – Isedi, Torino.
Scesi L., Papini M. & Gattinoni P. (2001) - Geologia applicata: il rilevamento geologico-tecnico – Casa editrice Ambrosiana, Milano, volumi 1 e 2.
Luis I. Gonzalez de Vallejo - Geoingegneria - Edizioni PEI.
Moisello U. – Idrologia tecnica – Edizioni Medea.
Francesco Fiorillo – Esplorazione geologica del sottosuolo – appunti del corso scaricabili dal sito del Dipartimento.

FINAL EXAM

An short written-graphic report on a course topic and final oral exam. During the course, tests are conducted on topics that have been described, allowing to control the degree of learning. Tests during the course, 2 to 3, are not considered for the final exam.
The written-graphic short report consists of a survey and analysis of geological-technical data. This work is preliminary to the final oral test.
The oral exam focuses on the theoretical and practical aspects of the course topics, with particular reference to both the descriptive capacity of the specific topic (methodology, classification, etc.) and the ability to link and frame the problem in a wider field, typical of geological and geological-technical problems.

CALENDAR EXAMS

2 Oct 2017;

22 Nov 2017;

23 Jan 2018;

20 Feb 2017;

27 Mar 2018;

22 May 2018;

26 Jun 2018;

24 Jul 2018;

11 Sep 2018;

23 Oct 2018;

27 Nov 2018

PRENOTAZIONE ESAMI

Rinvio al link

http://www.unisannio.it/it/user/783/didattica

SYLLABUS

	Hours	References	Type of lessons
Large-scale and detailed geological cross-sections: the main geometrical and geological methods for the construction of geological sections. Detection of cover deposits and their mapping.	6	Appunti del docente scaricabili dal sito del Dipartimento. Scesi L., Papini M. & Gattinoni P. (2001) - Geologia applicata: il rilevamento geologico-tecnico – Casa editrice Ambrosiana, Milano, volumi 1 e 2.	Frontal + Exercises
Introduction to rock mechanics and survey of rock mass discontinuities.	4	Hoek E. & Bray J.W. (1981) – Rock slope engineering – The Institute of Mining and Metallurgy ed., London. Alberto Bruschi – Meccanica delle rocce – Dario Flaccovio Editore.	Frontal + Exercises
Failure criteria of rock mass: criterion of Patton, Barton, and Hoek & Brown. Geomechanical classification: RMR index, Q index, GSI index.	8	Hoek E. & Bray J.W. (1981) – Rock slope engineering – The Institute of Mining and Metallurgy ed., London. Alberto Bruschi – Meccanica delle rocce – Dario Flaccovio Editore	Frontal + Exercises

Instability of rock mass along natural and cutting slopes. Kinematic analysis connected to one and two discontinuities (Markland method, Roman method). Slope stability analyses of natural and cutting slopes by analytical methods.	8	Hoek E. & Bray J.W. (1981) – Rock slope engineering – The Institute of Mining and Metallurgy ed., London. Alberto Bruschi – Meccanica delle rocce – Dario Flaccovio Editore	Frontal + Exercises
Underground works: main excavation methods and references to the relevant types of temporary and permanent support works.	4	Appunti del docente scaricabili dal sito del Dipartimento. Ippolito F., Nicotera P., Lucini P., Civita M., de Riso R. (1987) – Geologia tecnica – Isedi, Torino. Luis I. Gonzalez de Vallejo - Geoingegneria - Edizioni PEI.	Frontal
Detection of main hydrological parameters. Detection and analysis of rainfall, temperature, discharge data and their analyses. Main statistical data processing techniques: frequency distributions and return time.	8	Appunti e dispense forniti dal docente. Moisello U. – Idrologia tecnica – Edizioni Medea	Frontal + Exercises
Underground surveys and monitoring techniques. Boreholes perforation and water pressure measurements by piezometers. Main geotechnical tests on site. Monitoring of surficial and deep displacements by inclinometric probes and extensometers. Design and planning of a geo-technical survey.	8	Appunti del docente scaricabili dal sito del Dipartimento Luis I. Gonzalez de Vallejo - Geoingegneria - Edizioni PEI.	Frontal

Field trip on areas of particular interest (geomechanical survey, site with geognostic surveys in progress, visit to an area interested by underground excavation and support works).	8	-	-