



MODELLO SCHEDA INSEGNAMENTO

Corso di L/LM/LMCU	Laurea in Scienze geologiche
Denominazione insegnamento:	Elementi di Geologia Tecnica e Applicata
Numero di Crediti:	8
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 introduces the main geoapplicative issues, such as applied geology to engineering and spatial planning. Therefore, the topics discussed have a close connection with the most recurring ones in the Geologist profession and address the student towards a more typically technical culture formation.

THE FORMATIVE OBJECTIVES

At the end of the course the student is able to perform a geological-technical characterization of soils and knows the main technical characteristics of rocks. It includes the basic aspects of groundwater circulation, knowing how to evaluate hydraulic pressure, filtration water path, and stress distribution in the terrain. It knows the main techniques of geological surveyes, site tests and the main instruments of instrumental monitoring. He knows the main geo-technical problems of slope instability, the location and cultivation of quarries, the location, the exercise and the disposal of the quarries. It has basic notions about the main issues associated with the construction of civil engineering works and protection against natural hazards.

REQUIRED PRACTICES

Examination of Mathematics, Physics and Geology is required.

FREQUENCY OF LESSONS

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

CONTENTS OF THE COURSE

Panorama of geological-application problems: hazard and geological risk; protection the environment; realization of works of engineering; land planning; earth resources; protection of cultural heritage; exploration of the subsoil.

The rocks from the geological-technical point of view: the physical and mechanical properties of rocks. Physical properties and technical classifications of soils..

Elements of Hydrogeology and Hydrology.

Tension states and introduction to soil mechanics.

Main underground exploration techniques.

Landslides: main typologies and slope instability processes, with relative classifications.

Quarries: major geo-technical problems related to the opening, operation and disposal of excavation areas of quarry materials.

Landfill: Main geo-technical issues related to localization, exercise and disposal of areas destined for the collection of solid urban waste, special and toxic-harmful.

Dams: Main geo-technical issues related to localization, construction and exercise of earth dams and concrete dam.

DIDACTIC METHODS

The course is divided into theoretical frontal lessons and individual and group exercises. In addition, n.2 field trip will be carried out in areas for geological-technical issues. Movies and videos of interest to the discipline will also be screened.

The set of didactic activities will enable you to have a picture of the main geological-technical issues, knowing the main methods of study and analysis in the field.

REFERENCE TEXTS

Terzaghi K. & Peck R.B. (1989) - Geotecnica - UTET

Ippolito F., Nicotera P., Lucini P., Civita M., de Riso R. (1987) - Geologia tecnica - Isedi, Torino.

Blyth F.G.H. & de Freitas M.H. (1994) - A Geology for Engineers - Arnold ed., London.

Luis I. Gonzalez de Vallejo - Geoingegneria - Edizioni PEI.

Francesco Fiorillo - Esplorazione geologica del sottosuolo - appunti del corso scaricabili dal sito del Dipartimento.

Francesco Fiorillo - Geologia tecnica e laboratorio - appunti del corso scaricabili dal sito del Dipartimento.

FINAL EXAM

The profit test consists of a written test and a final oral exam. The written test consists of several exercises on course subjects, each with a certain score and with a total sum of 30. Students who get at least a score of 18 to the written exam are admitted to the oral exam.

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.

During the course, tests are conducted, based on exercises and tests on subjects that have been carried out; This allows you to control the students' degree of learning on the various themes and to adapt the course to the best. Trials during the course, 2 to 3, are not considered for the final exam.

CALENDAR EXAMS

scritto 13 Sept 2017, orale 2 Oct 2017;

scritto 15 Nov 2017, orale 22 Nov 2017;

scritto 23 Jan 2018, orale 30 Jan 2018;

scritto 13 Jan 2018, orale 20 Feb 2018;

scritto 20 Mar 2018, orale 27 Mar 2018;

scritto 15 May 2018, orale 22 May 2018;

scritto 19 Jun 2018, orale 26 Jun 2018;

scritto 17 Jul 2018, orale 24 Jul 2018;

scritto 4 Sep 2018, orale 11 Sep 2018;

scritto 16 Oct 2018, orale 23 Oct 2018;

scritto 20 Nov 2018, orale 27 Nov 2018;

PRENOTAZIONE ESAMI

Rinvio al link

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

SYLLABUS

	Hours	References	Type of lessons
Introduction to the course (panorama of geological-applicational problems), course progress and exams.	2	Teacher notes downloadable from the Department's website. Rules relating to the Geologist profession. Blyth F.G.H. & de Freitas M.H. (1994) - A Geology for Engineers - Arnold ed., London.	Frontal
Physical and mechanical properties of rocks. Main uses of rocks as building materials.	6	Teacher notes downloadable from the Department's website. Ippolito F., Nicotera P., Lucini P., Civita M., de Riso R. (1987) - Geologia tecnica - Isedi, Torino.	Frontal

Physical-volumetric properties and index properties of soils. USCS and ASSHO classifications	8	Teacher notes downloadable from the Department's website. Terzaghi K. & Peck R.B. (1989) - Geotecnica - UTET	Frontal + Exercises
The main laws of hydraulics and of hydrogeology: Pascal's principle, Bernoulli's theorem, Reynolds number, Darcy's law, Flow Equation (Laplace).	8	Teacher notes downloadable from the Department's website. Terzaghi K. & Peck R.B. (1989) - Geotecnica - UTET	Frontal + Exercises
Tensile states in the soil under hydrostatic and hydrodynamic conditions: the principle of effective stress, critical hydraulic gradient and efflux.	6	Appunti del docente scaricabili dal sito del Dipartimento. Terzaghi K. & Peck R.B. (1989) - Geotecnica - UTET	Frontal + Exercises
Introduction to Mohr's theory: point stresses and principal planes, normal and shear tensions, stress equations, Mohr circle, failure envelopes. The mechanical parameters of shear strength.	8	Teacher notes downloadable from the Department's website. Terzaghi K. & Peck R.B. (1989) - Geotecnica - UTET	Frontal + Exercises
Well tests (pumping and adsorption) for determination of hydraulic parameters.	2	Teacher notes downloadable from the Department's website. Terzaghi K. & Peck R.B. (1989) - Geotecnica - UTET Blyth F.G.H. & de Freitas M.H. (1994) - A Geology for Engineers	Frontal

		- Arnold ed., London.	
Main typologies and processes of slope instability and relative classifications. Methods of landslide mapping and relative techniques (empirical, statistical and deterministic).	8	Teacher notes downloadable from the Department's website. Terzaghi K. & Peck R.B. (1989) - Geotecnica - UTET Luis I. Gonzalez de Vallejo - Geoingegneria - Edizioni PEI.	Frontal
Quarries: major geo-technical problems related to the opening, operation and disposal of excavation areas of quarry materials.	2	Teacher notes downloadable from the Department's website. Terzaghi K. & Peck R.B. (1989) - Geotecnica - UTET Luis I. Gonzalez de Vallejo - Geoingegneria - Edizioni PEI.	Frontal
Landfill: Main geo-technical issues related to localization, exercise and disposal of areas for solid urban waste, special and toxic-harmful.	2	Teacher notes downloadable from the Department's website. Terzaghi K. & Peck R.B. (1989) - Geotecnica - UTET Luis I. Gonzalez de Vallejo - Geoingegneria - Edizioni PEI.	Frontal

<p>Dams: Main geo-technical issues related to localization, construction and exercise of earth and concrete dams.</p>	<p>2</p>	<p>Teacher notes downloadable from the Department's website. Terzaghi K. & Peck R.B. (1989) - Geotecnica - UTET Luis I. Gonzalez de Vallejo - Geingegneria - Edizioni PEI.</p>	<p>Frontal</p>
<p>Field trip on areas of particular interest (geo-technical surveys in progress, landslide areas, dams, spring areas and relative tapping), established during the course.</p>	<p>10</p>	<p>-</p>	<p>-</p>