



COURSE: Applied Geology			
ACADEMIC YEAR: 2016/2017			
TYPE OF EDUCATIONAL ACTIVITY: Characterizing			
TEACHER: Francesco Sdao			
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Language: Italian			
ECTS: 6	n. of hours: 60 lessons : 36 hours practice: 24 hours	Campus: Potenza School: Engineering Program: Civil and Environmental Engineering	Semester: II

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The main formative objective of the course is to provide students the techniques and the tools of the engineering geology for the design of civil engineering works (roads, dams, galleries); the use of rocks as natural construction materials; the hydrogeological study of aquifers and their vulnerability; the study and monitoring of slope instability. The main provided knowledges will be:

1. The geological cycle of rocks. Recognition, classification and physical and technical properties of the rocks;
2. The tectonic of the rocks (faults and folds);
3. The technical properties of the rocks;
4. Elements of geological-technical survey;
5. Basics of hydrogeology and study techniques of an aquifer;
6. Tools and methods for the study and monitoring of the landslide area;
7. basic knowledge of geology applied to the great works of Civil Engineering.

The main skills are:

1. To analyze and to recognize the main types of rocks;
2. To analyze and to interpret the results of geological-technical surveys of rock masses
3. To study and to identify the hydrogeological characteristics of an aquifer;
4. To assess the water potentiality and the aquifer vulnerability;
5. Main methods and tools of study and monitoring for landslide identification and analysis.
6. Application of the main methods of Engineering Geology for the study of the great works of engineering

PRE-REQUIREMENTS

For efficient understanding of the main topics of Engineering Geology, it is necessary to have acquired and assimilated the basic knowledge provided by the Physics and Chemistry courses.

SYLLABUS

1. Introduction to Engineering Geology. The geological cycle of the rocks. Characterization, classification and recognition of the rocks. Igneous, metamorphic and sedimentary rocks. The tectonic deformations of rocks: the faults and folds. Processes and weathering products of the rocks. Geological - technical characteristics of the rocks: physical, hydrogeological and mechanical properties (compressive strength, tensile strength, flexural strength, shear strength; laceration characteristics of the rocks, etc.). Elements of geological-technical survey of rock masses. Recognition and measurement of the main geological-technical parameters of structural discontinuities. Technical classifications of rocks (25 hours).
2. Introduction to the study of slope instability. Landslides: types, geomorphological features and characteristics of activities. Tools and methods for the study of the landslide area. Tools and methods for the monitoring of a landslide body. Elements of applied hydrogeology. The water in the soil. The main laws of underground hydrodynamics. Aquifers: hydrological and hydrodynamic characters. Fractured and porous aquifers. Investigations and hydrogeological tests. Sources: types and hydrogeological characteristics. Study methods of the flow rate hydrographs. The hydrogeological balance of the aquifers. Aquifers vulnerability: assessment methods and study cases (25 hours).
3. Geology applied to the great works of Engineering (roads, galleries and dams): geological- technical



problems in the different phases of design and study methods (10 hours).

TEACHING METHODS

The course includes 60 hours of lessons and exercises in classroom and in laboratory.

In particular, 40 hours of lessons and 20 hours of guided exercises in classroom and in laboratory are planned. At the end of the course a technical excursion is scheduled.

As regards the exercises, students are divided into groups (max 30 students per group). The students will have free access to the lab for further individual exercises.

EVALUATION METHODS

The aim of the exam test is to verify the level of attainment of previously mentioned training objectives.

The exam consists of a written test with 5 or 6 open questions concerning all the topics dealt in the course.

One of the questions concerns the macroscopic recognition of a rock. If the latter is insufficient, it is necessary to repeat the test. The duration of the test is scheduled in three hours.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

1. Notes provided by the teacher during the lessons and available on the site.
 2. Textbooks:
 - L. Scesi, M. Papini, P. Gattinoni (2001) – Geologia Applicata : il rilevamento geologico tecnico (volumi 1 e 2). Casa Ed Ambrosiana Milano
 - M. Civita (2005) – Idrogeologia applicata e ambientale, HOEPLI ed
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INTERACTION WITH STUDENTS

At the beginning, after illustrating the course program, the training objectives and the profit testing methods, the teacher provides students the didactic material of the lessons (pdf documents). Simultaneously, he collects a list of students who intend to register for the course, together with name, surname, registration number and e-mail.

Timetable of reception: Wednesday from 15:00 to 17:00 and Thursday from 8:30 to 10.30 in the professor office.

In addition to weekly reception, the professor is available at all times for a contact with the students by e-mail.

EXAMINATION SESSIONS (FORECAST)¹

SEMINARS BY EXTERNAL EXPERTS YES X NO

FURTHER INFORMATION

¹ Subject to possible changes: check the web site of the Teacher or the Department/School for updates.