UNIVERSITÀ DI PAVIA

Anno Accademico 2019/2020

APPLIED GEOLOGY

Enrollment year	2019/2020
Academic year	2019/2020
Regulations	DM270
Academic discipline	GEO/05 (APPLIED GEOLOGY)
Department	DEPARTMENT OF CIVIL ENGINEERING AND ARCHITECTURE
Course	CIVIL AND ENVIRONMENTAL ENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	2nd semester (02/03/2020 - 12/06/2020)
ECTS	6
Lesson hours	52 lesson hours
Language	Italian
Activity type	WRITTEN TEST
Teacher	MEISINA CLAUDIA (titolare) - 3 ECTS BORDONI MASSIMILIANO - 3 ECTS
Prerequisites	=Fundamentals some concepts of Chemistry, Physics
Learning outcomes	The course aims at furnishing a basic knowledge of Engineering Geology, referring in particular to the themes which have typical and widespread applications in Civil and Environmental Engineering. For this reason, the topic is analyzed not only by a geological approach, but also by the point of view of a technician that have to solve problems dealing with the themes of Earth Sciences. Since the course planning mainly practical, practice exercises are carried out, aiming at giving the required tools for the analysis of the main features of terrains and rocks, the analysis and the realization of thematic maps, the solution of maps problems, the application of most recent techniques in the branch of environmental problems.
Course contents	Principles of general Geology and Lithology: physics, compositions,

	structures and movements of Earth crust. Volcanic and seismic risks. Chemical-mineralogical composition and physical-chemical properties of the minerals which are the main components of the rocks. Classification of the rocks. The rocks as building materials: properties, application, zones of extraction. Weathering processes of the rocks. Weathering and pedogenesis. Geocronological correlation. Principles of Structural Geology: stiff deformations (lithoclase, faults, cleavage), plastic deformations (folds, flexures), mixed deformations (thrusts, covering) of rocks. Subsidence induced by natural processes or by fluids extraction. Principles of Geomorphology: geomorphological processes due to continental waters, glaciers, sea and wind. Hydrogeological risk. Slope stability analysis. Classification and causes of landslides. Geological exploration of underground: percussional and rotational drilling. Continuous logging. Electrical and seismic surveys and their limits. Editing of stratigraphies and realization of 2d- and 3d-stratigraphical profiles. Principles of hydrogeology: the water cycle. Porosity and conductivity of the terrains. Darcy's law. Dynamics of underground waters. The water tables. Relations between superficial and underground waters. Permability of rocks. Karsts phenomena. The springs and their different classifications. Geology of engineering works: geological surveys and planning phases for the realization of: transport routes (roads in plain areas, roads in hilly areas, roads in mountain areas; defence works of roads); tunnels (tunnels and wall tunnels); dams (stiff, deformable, under-river). Practical lessons: macroscopic identification of the rocks. Solution of maps exercises. Reading and interpretation of geological maps.
Teaching methods	Lectures (hours/year in lecture theatre): 45 Practical class (hours/year in lecture theatre): 0 Practicals / Workshops (hours/year in lecture theatre): 0
Reccomended or required readings	P.Canuti, U. Crescenti, V. Francani . Geologia applicata all'ambiente. CEA. L. Scesi, M. Papini, P. Gattinoni. Geologia applicata. Ed. CEA Course notes, scientific articles and other material will be provided during the course.
Assessment methods	=Only written exams
Further information	=Only written exams
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile