



GEOTECHNICS

Enrollment year	2021/2022
Academic year	2021/2022
Regulations	DM270
Academic discipline	ICAR/07 (GEOTECHNICS)
Department	DEPARTMENT OF EARTH AND ENVIRONMENTAL SCIENCES
Course	GEOSCIENCES FOR SUSTAINABLE DEVELOPMENT
Curriculum	GEOSCIENZE APPLICATE ALLA GESTIONE DELL'AMBIENTE
Year of study	1°
Period	2nd semester (01/03/2022 - 10/06/2022)
ECTS	6
Lesson hours	54 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	ANSELMI GABRIELE (titolare) - 6 ECTS
Prerequisites	NON CI SONO PREREQUISITI
Learning outcomes	The course aims to address the aspects inherent soil and rocks preferring a geological-geotechnical approach that can be of practical use to engineering support in the field of large infrastructural works. The purpose of the learning hours is to provide a complete picture of all the data, classifications and simplified calculations that are necessary for a definition of the geotechnical and geomechanical parameters to be used for the geotechnical project In particular, in addition to the soil classification and methodologies that refer at direct responsibility of the geologist and that are addressed of the design development in the field of underground works will be analyzed. Through the use of the various teaching modules, will be shown activities that intersect with the engineering project and that involve the problems related to soil improvement, engineering, the use of soil and rocks and environmental issues,when is involved the

Course contents

First module-12 hours

Soil classification , reference parameters, on-site and laboratory tests, interpretation of tests in order to define geotechnical parameters of the soil, hydraulic parameters, soil stability checks and related regulations for earthworks.

During the lessons will be dealt with real cases relating to the construction of earth works pertaining to the geologist who will refer to the materials and the usual tests for the verification of quality and the related controls during the work.

Second module 12 hours

Classification of rocks, geomechanical reference parameters, on-site and laboratory tests, use of parameters for the sizing of excavations and underground works. Excavation in rock of slopes tools and types, Excavation in underground mechanized and traditional method. Soil improvement. Hydrogeology in rocks, permeability tests, hydraulic fracturing, karst and dewatering systems

Third module 6 hours.

Surface foundations, deep foundations, type of containment works, poles, micropiles, diaphragms and piling. Jet Grouting. Soil liquefaction analysis. Seismic, tests for the determination of the classes of use. Regulatory notes NTC 2018

Fourth module 2 hours.

Dewatering systems for outdoor and underground works. Wells, well point drainage trenches for foundation works and on slopes. Application examples

Fifth module 2 hours

Forest engineering. Works of arrangement slopes and their sizing. Application examples. Rockfall barriers and passive protection systems of slopes and excavation area.

Sixth didactic module 2 hours

Soil and rocks, analysis for land reclamation, characterization plans, regulations and forms. Technical regulations.

Seventh module 4 hours

Road and rail geotechnics. Investigations, materials, construction , tests

Teaching methods

Lectures (hours/year in lecture theatre): 40

Practical (hours/year): 14

Reccomended or required readings	Lecture notes, scientific articles and other didactic material will be distributed during classes. The following monographs are recommended: Lancellotta, R. (2012). Geotecnica (4th edition). Zanichelli. Atkinson, J. (1997). Geotecnica - Meccanica delle Terre e Fondazioni. Mc Graw Hill Lambe, T.W. (1991). Soil Testing for Engineers. BiTech Publishers. Lambe, T. W. & Whitman, R. V. (1990). Soil Mechanics. John Wiley & Sons,. Bowles(1991)Foundation John Wiley & Sons
Assessment methods	The final exam consists of an oral test of about an hour where all the topics discussed and illustrated during the lessons will be treated.
Further information	Lecture notes, scientific articles and other didactic material is posted at the KIRO web site
Sustainable development goals - Agenda 2030	\$lbl_legenda_sviluppo_sostenibile