

CIVIL AND ENVIRONMENTAL ENGINEERING

Ateneo - Geotechnical Engineering

Funded By	Politecnico di TORINO [P.iva/CF:00518460019]
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Context of the research activity	Research within the field of geotechnical engineering
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Objectives	<p>Research topic concerning the interpretation and modelling of the physical, hydraulic and mechanical behaviour of soils, rocks and other porous and/or fractured, natural or artificial multiphase media (geomaterials), as well as of the infrastructures constituted by them and/or interacting with them, based on the physical-mathematical and chemical disciplines. It finds application in civil, construction, environmental and industrial engineering.</p> <p>The research will cover one or more of the following specific topics:</p> <ul style="list-style-type: none"> - investigation and measurement methodologies in the laboratory and in situ for the determination of the chemo-physical, hydraulic and mechanical properties of geomaterials; - the physical, theoretical and numerical modelling of the physical-mechanical behaviour of geomaterials and their interaction with the engineering works in response to static, cyclic and dynamic stresses and taking consideration of hydraulic, thermal and chemical aspects; - the analysis, design, realisation and monitoring of works and interventions of engineering works such as: foundations, excavations, retaining and protective works, underground constructions, embankments, river banks and earth dams, landfills, reclamation and landfills, remediation and securing of contaminated groundwater and soil, the underground storage of fluids and nuclear waste, underground utility networks, landfills, port, coastal defence and off-shore works; - the engineering study of deformation processes or land instability, such as landslides, subsidence, liquefaction and cavity collapses, through the planning of investigations, monitoring, analysis of mechanisms, the design of safety and damage reduction interventions; - analysis and modelling of the effects of earthquakes on soil and rock, aimed at the prediction of the seismic response at the territorial scale, as well as the assessment of site stability and of the soil-structure interaction; - zoning studies on a quantitative basis of risks of natural or anthropogenic origin and the definition of strategies for their analysis and mitigation; - the geotechnical aspects of interventions for the maintenance and safeguarding of the built heritage, including historical, cultural and archaeological heritage;
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- the improvement of the properties and consolidation of soil and rock masses, including through the use of geosynthetics and other materials and sustainable technologies;
- geotechnical aspects of innovative and sustainable solutions for the protection environment and for energy supply from renewable and non-renewable sources.

Skills and competencies for the development of the activity

Continuum mechanics
Soil mechanics
Rock Mechanics
Slope Stability
Earthquake Geotechnical Engineering
Foundations