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CIVILE E AMBIENTALE

CIVIL AND ENVIRONMENTAL ENGINEERING

DOCTORAL PROGRAM 2024-2025

Diana Salciarini holds the position of Associate Professor of Geotechnical Engineering within the Department of Civil and Environmental Engineering at the University of Perugia. She obtained her Master's Degree with Honors and completed her PhD at the University of Perugia. She has co-edited a book on Soil-Structure Interaction, co-authored a monograph on Retaining Structures, and vaunts over 90 publications encompassing international journals, book chapters, and conference contributions in the fields of soil-structure interaction, energy geostructures, and landslide modelling. She successfully coordinated numerous national and international research projects, funded by the public and industrial sectors.

Location

Campus of Engineering of University of Perugia
Via G. Duranti, 93 - Perugia

Schedule (18 hours, 3 CFU)

8th October, 9:00-11:00, Auletta
9th October 9:00-13:00, Auletta
14th October, 9:00-13:00, Auletta
15th October, 9:00-13:00, Auletta
21st October, 9:00-13:00, Auletta

SOIL DYNAMICS AND SOIL-STRUCTURE INTERACTION UNDER DYNAMIC LOADING CONDITIONS

Course Description

The course will provide an overview of the Soil-Structure Interaction (SSI) problem and various approaches to incorporate it into modeling. In engineering practice, buildings are often designed with the assumption that their base is fixed to the ground, disregarding SSI. While this assumption may be considered reasonable for low-rise buildings on relatively stiff soils, the impact of SSI becomes more pronounced when dealing with heavy structures founded on relatively soft soils. Soil deformability can lead to a significant increase in the overall deformation of the system, resulting in the accumulation of substantial irreversible displacements and a different distribution of internal forces, ultimately reducing the structural demand. First, the course will present the common approach that addresses SSI effects by modeling the soil-foundation system using (visco-)elastic elements characterized by stiffness and damping coefficients. Secondly, more effective methods, such as those based on the macroelement concept, will be introduced. They lump the response the foundation-soil system response into a single computational node, using an inelastic equation based on generalized loads and displacements. Applications for practical case studies will be presented to demonstrate the effectiveness of this approach.

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