

Course offered for the PhD program in Civil, Chemical and Environmental Engineering
TOP SCIENTISTS SERIES
a.a. 2018/2019

(course is open for participation of students from other Ph.D. programs)

1. Title

Fundamentals of Soil Dynamics

2. Course Description

The course is aimed at providing the basic concepts and experimental tools to analyze the behavior of geomaterials under time-dependent loading. Although calibrated on the study of soils and rocks, the topics of the lectures can be extended to further one- or multi-phase natural or artificial media with granular or continuous solid fabric, taking into account their possible layered and heterogeneous nature, as well as their non-linear and dissipative behavior under cyclic loading.

The lectures will describe the main aspects of soil behavior under cyclic and dynamic loading and the experimental tools to measure the relevant mechanical properties.

Synthetic list of topics:

- Basic concepts in dynamic analysis.
- Propagation of elastic waves in layered solids.
- Fundamentals of soil behaviour under cyclic and dynamic loading.
- Experimental characterization by in situ and laboratory testing.

The applications may include experimental characterization and constitutive modeling of materials pertaining to civil and industrial engineering subjected to dynamic loads of both anthropic and environmental nature. The preliminary knowledge of basic concepts such as complex algebra applied to harmonic functions and dynamic equilibrium of a simple oscillator are expected; if not so, they might be shortly recalled in the lectures.

3. Course Organization

	Timetable	Date	Room
Fundamentals of Soil Dynamics – part 1	9:30-12:30	27 May	Salone Nobile –Villa Cambiaso
Fundamentals of Soil Dynamics – part 2	14:30-17:30	27 May	Salone Nobile –Villa Cambiaso

4. Teacher

Prof. Francesco Silvestri, Università di Napoli Federico II, Dipartimento di Ingegneria Civile, Edile e Ambientale.

5. Duration and credits

6h, 2 CFU

6. Activation mode and teaching period

Tentative date: May 27, 2019

7. Deadline for registration

All students of the Department PhD Program are enrolled.

8. Final exam

Questionnaire (multiple-choice questions)