

UE Soil dynamics and nonlinear site response analysis



Level
Baccalaureate
+5



ECTS
3 credits



Component
UFR PhITEM
(physique,
ingénierie, terre,
environnement,
mécanique)



Semester
Printemps

- > **Teaching language(s):** English
- > **Open to exchange students:** Yes
- > **Code d'export Apogée:** PAX9CEAP

Presentation

Description

Fundamentals: Soil behaviour under earthquake loading: Fundamentals of soil behaviour under cyclic and dynamic loading. Basic mechanical models. Non-linear stiffness, damping, cyclic strength, liquefaction.

Geotechnical characterisation: Techniques and examples of characterization of layered soils by in situ tests: borehole and surface methods. Techniques and examples of results of laboratory tests: cyclic triaxial, simple shear, torsional shear, resonant column. Factors influencing stiffness and damping. Linear equivalent models for dynamic analyses.

Liquefaction: Case histories of liquefaction worldwide; Evaluation of liquefaction potential by empirical to analytical methods. Zonation for liquefaction.

Slope stability: Case histories of slope failures worldwide; Analysis: pseudo-static methods, displacement analysis, advanced analyses. Examples of seismic analysis of natural slopes, earth dams and embankments. Zonation of slope stability.

Tutorials (with laptop): 1D site response analysis and assessment of liquefaction potential. Slope displacements by simplified dynamic analysis



Course parts

| | | |
|----------------------------|---------------|-----|
| CM | Lectures (CM) | 21h |
| Period : Semester 9 | | |

Useful info

Campus

› [Grenoble - University campus](#)