

PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
SCHOOL OF ENGINEERING
DEPARTMENT OF STRUCTURAL AND GEOTECHNICAL ENGINEERING
ABET COURSE SYLLABI

ICE3663 SOIL DYNAMICS

Credits and contact hours: 10 UC credits / 10 hours (3 h. Lectures; 1,5 h. Assistantship; 5,5 h. Independent learning experiences)

Instructor's name: Esteban Sáez

Course coordinator's name Esteban Sáez

Textbook:

- Semblat, J.; Pecker, A. (2009), Waves and vibrations in soils: earthquakes, traffic, shocks, construction works.
- Towhata, I. (2008), Geotechnical Earthquake Engineering.

Course Catalog Description: Soil dynamics is a relevant topic on civil engineering projects developed on countries with high level of seismic activity, and in the analysis of the foundation systems of vibrating machines. In this course, students will study the theory of wave propagation, dynamic properties of ground, seismic settlements, liquefaction, seismic behavior of superficial and deep foundations, ground-structure interaction and foundation systems for vibrating machines.

Prerequisite Courses: ICE2614 Soil mechanics

Co-requisite Courses: None

Status in the Curriculum: Required

Course Learning Outcomes:

1. Understand the basic aspects of wave propagation on soil.
2. Study and measure the different dynamic properties of soil.
3. Analyze and evaluate the dynamic behavior of soil and foundations.
4. Apply the concepts of dynamics of soil to the design of vibrating machines.

Relation of Course to ABET Criteria:

- a. Knowledge of mathematics, science and engineering
- c. Design a system, component, or process
- e. Identify, formulate, and solve engineering problems
- k. Techniques, skills, and modern tools for engineering practice.

Topics covered:

1. Introduction to the problems of vibrations on soil.
2. Mechanic wave propagation 1D.
3. Mechanic wave propagation 2D/ 3D.
4. On-site methods for the determination of the dynamic properties of soil.

5. Dynamic behavior of soil.
6. Liquefaction.
7. Dynamic soil-structure interaction.
8. Seismic response of geotechnical projects.
9. Vibrating machine foundations.