

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

**ICE2833 STRUCTURAL DESIGN PROJECT: REINFORCED CONCRETE
BUILDING**

Credits and contact hours: 10 UC credits / 10 hours (3 h. Lectures and 7 h. Independent learning experiences)

Instructor's name: Leopoldo Breschi / Augusto Holmberg

Course coordinator's name None

Textbook:

- American Concrete Institute Building (2008) Code Requirements for Reinforced Concrete. ACI 318-2008. Detroit, Michigan, 2008.
- Instituto Nacional de Normalización (2007) Diseño estructural de edificios - cargas permanentes y sobrecargas de uso. NCh 1537.Of 2007, Santiago, Chile.

Course Catalog Description: Students will be faced to the design process of a real reinforced concrete building. They have to define the load cases using Chilean codes, perform the structural analysis of the building, design the structural members following the corresponding material codes (ACI, NCh), and draw some typical details of the main structural elements they have designed.

Prerequisite Courses: ICE2413 Reinforced concrete and ICE2703 Earthquake engineering

Co-requisite Courses: None

Status in the Curriculum: Required

Course Learning Outcomes:

1. Understand and apply building design codes.
2. Understand the design process of a reinforced concrete building.
3. Analyze and design a reinforced concrete building.

Relation of Course to ABET Criteria:

- b. Design and conduct experiments: analyze and interpret data
- c. Design a system, component, or process
- d. Multidisciplinary teams
- e. Identify, formulate, and solve engineering problems
- f. Professional and ethical responsibility
- g. Effective communication
- h. Broad education necessary for global, economic, environmental and societal context
- i. Recognition of the need for, and an ability to engage in life-long learning

Topics covered:

1. Structure and load determination.
 - 1.1. Initial structure.
 - 1.2. Static load determination.
 - 1.3. Seismic load determination.
 - 1.4. Design load combinations.

2. Structural element dimensioning.
 - 2.1. Slab design.
 - 2.2. Beam design.
 - 2.3. Column and shear wall design.
 - 2.4. Foundation design.

3. Reinforcement detailing.
 - 3.1. Reinforcement detailing drawing for main structural elements.