

PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
SCHOOL OF ENGINEERING
DEPARTAMENT OF CONSTRUCTION ENGINEERING AND MANAGEMENT
ABET COURSE SYLLABI

**ICC2904 WORKSHOP OF IMPROVEMENT IN CONSTRUCTION
ENGINEERING (CAPSTONE)**

Credits and contact hours:	10 credits / 10 hours (1 hour Lectures, 2 hours Independent learning experiences and 7 hours of group work concerning the project each week)
Instructor's name:	Not defined yet
Course coordinator's name	Luis Fernando Alarcón (Head of the Major Program)
Textbook:	<ul style="list-style-type: none">- De Solminihac, H.; Thenoux, G. (2008) Procesos y técnicas de construcción. 5th edition. Ediciones UC. Santiago, Chile- Allen, E., Iano, J., Fundamentals of Building Construction: Materials and Methods, Wiley, 2008- Spence, W., Construction Materials, Methods, and Techniques, Delmar Cengage Learning, 2006
Course Catalog Description:	<p>Capstone design course for the construction engineering major at the Bachelor of Science level. In this course students apply the competences acquired in the minimum required courses of the specific field of study, in relation to project planning and control, construction technologies, construction materials, budget preparation, materials selection and that are needed to carry out a specific project within construction.</p> <p>This course aims at designing innovating construction solutions that solve real problems of the industry.</p> <p>Furthermore, it considers a project based methodology, including theoretical contents and team work regarding the development and design of technical solutions for a simple construction problem under technical, time and cost restrictions.</p>
Prerequisite Courses:	ICC2104 Technology of Civil Engineering Materials and ICC2204 Project Planning and Control and ICC2304 Construction Engineering
Co-requisite Courses:	None
Status in the Curriculum:	Required
Course Learning Outcomes:	<ol style="list-style-type: none">1. Identify and conceptualize a technical problem including causes and restrictions.2. Design and transfer technologies responding to specific problems.3. Programming the implementation of a solution (or construction operation) according to the restrictions.4. Estimate quantities, costs and technical needs of the necessary

resources to carry out the implementation of a solution (or construction operation) at its conceptual stage.

5. Understand and use the technical and/or economical basis for the selection considering the existence of a range of alternatives.
6. Apply engineering concepts and principles, in the problems of cost estimates and economic analysis.

**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. Introduction to case studies: general description, presentation of technical and economic background of the cases.
2. Design – problem solving: problem identification and solving, design concepts.
3. Engineering economic concepts: cost engineering, cost management, cost estimation techniques, concept of risk and uncertainty, and contingency analysis.
4. Workshops: improvement project execution: specific tasks in the design of construction solutions, where a professor guides students in the process of integration and critical analysis of the work. This includes team work and preparation of technical reports and presentations during the project development.