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:
- Spence, W., Construction Materials, Methods, and Techniques, Delmar Cengage Learning, 2006

Course Catalog Description: Capstone design course for the construction engineering major at the Bachelors 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.
This course aims at designing innovating construction solutions that solve real problems of the industry.
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.

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:
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.
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.