ICC3914   INFORMATION TECHNOLOGY IN THE CONSTRUCTION INDUSTRY

Credits and contact hours: 10 credits / 10 hours (Lectures: 1,5 hours/week / Lab: 1,5 hours/week / Independent learning experiences: 7 hours/week)

Instructor's name: Claudio Mourgues

Course coordinator's name Claudio Mourgues

Textbook: McGraw Hill (2008) - *BIM handbook: a guide to building information modeling for owners, managers, designers, engineers and contractors*. Eastman, C.; Teicholz, P.; Sacks, R.; Liston, K.

Course Catalog Description: The course objective is to show students how the application of IT in combination with work processes and people suitable for their application today are an indispensable requirement in the execution and management of projects and businesses in the construction area. The course aims to familiarize students with the various developments and applications of information technology existing today in the construction field in both the practice and research spheres. The student must know what IT is and how it can be used in the different processes of a construction project (design, procurement, construction, control, accounting, etc.), and/or how these processes should be adapted or redesigned to exploit the potential provided by IT. The student must be able to identify the impact, needs and opportunities related to IT and its influences on the organization of projects and construction companies.

Prerequisite Courses: ICC2104 Technology of Civil Engineering Materials and ICC2304 Construction Engineering and ICC2204 Project Planning and Control

Co-requisite Courses: None

Status in the Curriculum: Required

Course Learning Outcomes:

a. Understanding of the importance of information, information technology and information management for the architecture, engineering, and construction industry.

b. Understanding of the structure and flow of information in construction projects and their inter-relationships between the various projects stakeholders (clients, contractors, architects, engineers, financers, community, etc).

c. Ability to identify and explain the fundamental concepts and elements of information technology.

d. Ability to identify the key information technology in the architecture, engineering, and construction industry.
e. Ability to select information technologies based on project or company needs.
f. Ability to use information technologies for specific problems.
g. Ability to evaluate the challenges and impact of implementing information technology in different scenarios.
h. Ability to optimize the data structure at the project and company level.
i. To be a change agent for companies and project that seek to use the information resource more effectively and efficiently.

Relation of Course to ABET Criteria:

a. Knowledge of mathematics, science and engineering
b. Design and conduct experiments: analyze and interpret data
c. Design a system, component, or process
e. Identify, formulate, and solve engineering problems
h. Broad education necessary for global, economic, environmental and societal context
k. Techniques, skills, and modern tools for engineering practice.

Topics covered:

1. Introduction- Specific Objectives: a and b
   1.1. Use and importance of information in the architecture, engineering and construction industry: Information flows and the need for IT
   1.2. IT Fundamentals- Specific objectives: c, IT and its elements
   1.3. Product, process and organizational models - Specific objectives: b, d and Virtual Design and Construction, VDC, POP Matrix and Models, Produce Models: BIM, nD, parameter models, laser scanner, model checking, good practices, SIG, VR., Process models, simulation, 4D models, Organization models
   1.4. Management systems - Specific objectives: d and g: ERP, Advance plann controls, Budgets and cost controls, Materials management, Labor Manag Document Management
   1.5. Communication and Collaboration - Specific objectives: d and g: Collabc technology, Extreme collaboration (XC), Collaboration through product n Immersive work strategies
   1.6. Future applications - Specific objectives: d and g
   1.7. Knowledge management - Specific objectives: b and h
   1.8. Interoperability - Specific objectives : g
   1.9. IT Selection and implementation – Specific objectives: e, f and g