

CA3168: BUILDING INFORMATION MODELLING FOR CAPITAL PROJECTS

Effective Term

Semester A 2022/23

Part I Course Overview

Course Title

Building Information Modelling for Capital Projects

Subject Code

CA - Civil and Architectural Engineering

Course Number

3168

Academic Unit

Architecture and Civil Engineering (CA)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

CA1167 Engineering Communication Students must have attempted (including class attendance, coursework submission, and examination) the precursor course(s) so identified.

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

This course is an introduction courses to BIM and provides students hands-on experience for applying BIM technologies to construction projects. This project-based course would allow the students to gain knowledge in implementing BIM throughout the lifecycle of capital projects, from planning, design, to construction, operation and demolition. In class, the course will only provide an introductory on BIM software tools instead of full-coverage training on software. Students are expected to conduct self-learning and exploring of the software to become able to use the tools effectively.

Course Intended Learning Outcomes (CILOs)

| | CILOs | Weighting (if app.) | DEC-A1 | DEC-A2 | DEC-A3 |
|---|--|---------------------|--------|--------|--------|
| 1 | Define BIM, and describe the benefits of applying BIM in capital projects | 10 | x | | |
| 2 | Describe the workflow of applying BIM across different stakeholders in the capital project life cycles | 10 | | x | |
| 3 | Apply BIM technologies for different activities in the lifecycle of capital projects | 50 | | x | |
| 4 | Communicate ideas through BIM | 20 | x | | |
| 5 | Understand the cutting-edge BIM-related technologies and their application in practice | 10 | x | | |

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Teaching and Learning Activities (TLAs)

| | TLAs | Brief Description | CILO No. | Hours/week (if applicable) |
|---|-----------------------|--|---------------|----------------------------|
| 1 | Lecture | Explain the fundamental principles, technologies and current applications of building information modelling. | 1, 2, 3, 4, 5 | |
| 2 | Assignments | Require students to review/apply BIM knowledge on tasks related to civil and architecture engineering. | 3, 4, 5 | |
| 3 | Computer Lab Tutorial | Provide hand-on experience on BIM-related computer tools. | 2, 3, 4 | |

Assessment Tasks / Activities (ATs)

| | ATs | CILO No. | Weighting (%) | Remarks (e.g. Parameter for GenAI use) |
|---|-------------|-----------------|----------------------|---|
| 1 | Quizzes | 1, 2, 3, 5 | 20 | |
| 2 | Assignments | 1, 2, 3, 4 | 80 | |

Continuous Assessment (%)

100

Examination (%)

0

Assessment Rubrics (AR)**Assessment Task**

Quizzes

Criterion

Capacity of understanding the fundamental principles and technologies of BIM.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Assignments

Criterion

Ability to analyse and critique the BIM applications in construction projects; Capacity of applying the BIM technology to complete a specific task in construction engineering. Capacity to integrate various BIM-related technology for a construction project.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

BIM, Simulation, Clash Detection, Facility Management, Virtual Design and Construction.

Reading List

Compulsory Readings

| Title | |
|-------|---|
| 1 | BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors by Chuck Eastman, Paul Teicholz, Rafael Sacks, and Kathleen Liston (2011) |
| 2 | Mastering Autodesk Revit 2018 by Lance Kirby, Eddy Krygiel, and Marcus Kim (2017) |
| 3 | Up and Running with Autodesk Navisworks 2018 by Deepak Maini (2017) |

Additional Readings

| Title | |
|-------|---|
| 1 | BuildingSMART alliance: http://www.nibs.org/?page=bsa |
| 2 | BIM Journal: http://www.bimjournal.com/ |
| 3 | Automation in Construction: http://www.journals.elsevier.com/automation-in-construction/ |
| 4 | Journal of Computing in Civil Engineering: http://ascelibrary.org/journal/jccee5 |