CA3791: COMPUTER AIDED DESIGN PRACTICES

Effective Term
Semester A 2022/23

Part I Course Overview

Course Title
Computer Aided Design Practices

Subject Code
CA - Civil and Architectural Engineering
Course Number
3791

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
Nil

Equivalent Courses
BC3791/BC3791P Computer Aided Design Practices/CA3793 System Modelling for Architectural Engineering

Exclusive Courses
Nil

Part II Course Details

Abstract

This course aims to provide students with awareness and understanding of computer aided design and engineering practice with respect to building services engineering and to allow students to explore various computer based methods for carrying out basic building services design tasks.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	formulate the computer aided design techniques and engineering practices with respect to building services engineering;		x	x	
2	apply various computer based methods for carrying out basic design tasks;			x	x
3	examine the relative importance of various design parameters on building services designs through using of sensitivity analysis; and		x	x	
4	create a consistent computer aided design approach to solve engineering problems;				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	Lectures	Explain the key concept of CAD management and system modelling techniques and analyze the importance of different design parameters.	1, 2, 3, 4	
2	Tutorials	Practise the use of computer tools to design basic building services systems	1, 2, 3, 4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Mid-term Test	1, 2, 3, 4	20	
2	Coursework: Design based assignments	1, 2, 3, 4	30	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Additional Information for ATs

To pass a course, a student must obtain minimum marks of 30% in both coursework and examination components, and an overall mark of at least 40%

Assessment Rubrics (AR)

Assessment Task

Mid-term Test

Criterion

ABILITY to EXPLAIN the key concepts of CAD management and system modelling

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

Coursework: Design based assignments

Criterion

ABILITY to DESIGN basic building services systems by use of computer tools

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
Examination

Criterion
ABILITY to EXPLAIN the key concepts of CAD management and system modelling

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

Introduction to computer. Introduction to the concepts of programming languages. Matlab programming. Computing tools for building engineers. AutoCAD for building design. Computer applications in building and construction engineering. Building thermal and energy simulation. Lighting simulation. Computational fluid dynamics.

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	Chartered Institution of Building Services Engineering. (1994), Code for Interior Lighting, CIBSE, London. (TH7715.C32 1997)
2	Port, S. (1989), The Management of CAD for Construction, BSP Professional, Oxford. (TA174.P65)

3	Dukkipati, R.V. (2010), Matlab: An Introduction with Applications, Anshan, Tunbridge Wells. (QA297.D845 2010)
4	Palm, W.J. (1999), Matlab for Engineering Applications, WCB/McGraw-Hill, Boston. (QA297.P33 1999)American Society of Heating Refrigerating & Air-conditioning Engineers (ASHRAE), (latest edition), ASHRAE Handbook - Fundamentals. ASHRAE, Atlanta, GA. (TH7011 .A825)