

CA4717: ELECTRICAL ENGINEERING PRACTICES

Effective Term

Semester A 2024/25

Part I Course Overview

Course Title

Electrical Engineering Practices

Subject Code

CA - Civil and Architectural Engineering

Course Number

4717

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

CA3712 Electrical Services

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

The course equips student with knowledge of electromagnetic compatibility, power quality and the usage of a diesel generator and an uninterruptible power supply in buildings; and also the basic concept of high voltage engineering in modern buildings.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the electricity supply system, supply rules and their relationship with sustainable development;	20		x	x
2	Explain the specifications of electrical distribution systems in buildings;	40		x	x
3	Explain an emergency power supply systems;	20	x		x
4	Explain the overcurrent and electric shock protection.	20	x		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.

Learning and Teaching Activities (LTAs)

LTAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures and Tutorials	1. Student will engage with key theories of energy source and sustainable electrical system design. 2. Student will engage with the concept and application of statutory regulations, design considerations of electrical distribution networks, earthing systems, lightning protection. 3. Student will engage with the concept and participate in the design of diesel generators, various types of uninterruptible power supplies (UPS). 4. Student will engage with concept of various cable fault location techniques and their comparison.	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	20	
2	Coursework	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 DEMONSTRATE electrical system design. CAPACITY to SUGGEST green and sustainable system design.

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

Criterion

ABILITY to DEMONSTRATE the understanding on electrical system calculation.

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 RELATE and EXPLAIN building codes and design principles of electrical installation. ABILITY to USE scientific techniques to solve design problems.

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

Electromagnetic environment. Causes and impacts of electric power harmonics. LV distribution systems. Protection and load flow. Electrical insulators. Emergency generator design and UPS.

Reading List**Compulsory Readings**

Title	
1	Nil

Additional Readings

Title	
1	EMSD, Code of Practice for Electricity (Wiring) Regulations, 2009.
2	BSI and The Institution of Electrical Engineers, Requirements for Electrical Installations - IEE Wiring Regulations 17th Edition, 2008.
3	Tony Sung, Advanced Electrical Services Engineering Volume 1- Fundamental Theory & LV Electrical Installation Design, Smart and Sustainable Technologies Publishing Co. Ltd., Hong Kong, 2010.
4	The IEE, Electrical Installation Design Guide-Calculation for electricians and Designers, IET, UK, 2008.