

CA4738: FIRE ENGINEERING APPROACH

Effective Term

Semester A 2022/23

Part I Course Overview

Course Title

Fire Engineering Approach

Subject Code

CA - Civil and Architectural Engineering

Course Number

4738

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

CA3732 Fire Engineering and Piped 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

This course aims to provide students with in-depth knowledge in performance-based fire engineering approach and deterministic and probabilistic fire engineering approaches and statutory requirements on alternative design and relevant legislation control.

Course Intended Learning Outcomes (CILOs)

CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1 discover the performance-based codes for fire engineering systems;		x	x	
2 implement analysis of the fire risk of buildings;		x	x	
3 apply current technologies of fire engineering to solve fire engineering problems;				x
4 design fire engineering approach for simple fire 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 concepts in performance-based fire safety engineering	1, 2	
2 Tutorials	Apply the concepts to solve basic fire problems and design a fire engineering approach for solving holistic fire engineering problem	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 Assignment	3, 4	10	
3 Project Report and Presentation	3, 4	20	

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 DEVELOP understanding on the theories of fire safety engineering

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

Assignment

Criterion

ABILITY to APPLY fire engineering tools to solve basic fire engineering 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

Assessment Task

Project Report and Presentation

Criterion

ABILITY to DESIGN a performance-based fire engineering approach to solve a fire engineering problem

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 DEVELOP understanding on the theories of fire safety engineering and APPLY the theories to solve the basic fire engineering 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

Reliability study. Performance based building fire codes. Deterministic approach. Probabilistic approach. Fire risk assessment. Building evacuation. Performance-based codes for the fire engineering systems.

Reading List

Compulsory Readings

Title	
1	Nil

Additional Readings

Title	
1	A. E. Cote - Fire Protection Handbook, National Fire Protection Association, Quincy, Mass.
2	W.D. Moore - National Fire Alarm Code Handbook, NFPA, Quincy, Mass.
3	SFPE Handbook of fire protection engineering, Philip J. DiNenno et al., Society of Fire Protection.