

CA3732: FIRE ENGINEERING AND PIPED SERVICES

Effective Term

Semester A 2025/26

Part I Course Overview

Course Title

Fire Engineering and Piped Services

Subject Code

CA - Civil and Architectural Engineering

Course Number

3732

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

For ARCE Major: CA2626 Thermal Engineering for Building Engineers and CA2627 Building Science and CA2123 Engineering Methods. For other students: CA2627 Building Science or SEE2101 Engineering Thermofluids I. 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 provides essential knowledge of waste handling systems and analytical ability to solve the hydraulic calculations in fire engineering and plumbing services such that the students can prepare themselves for taking the fire engineering electives.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	describe the principles of building hydraulic systems	15	x	x	
2	select and apply engineering options in designs of building hydraulic systems	30		x	
3	compare the design options and examine different fire protection systems	20	x	x	
4	apply hydraulic calculation techniques to piped services and fire protection systems.	35		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	Lecture	Students will engage in system designs of different building hydraulic and fire engineering systems	1, 2, 3, 4	
2	Tutorial	Students will engage in case studies on different hydraulic and fire engineering systems	1, 2, 3, 4	

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Mid-term Test	1, 2, 4	20	-	No
2	Laboratory Report	1	15	-	No

3	Exercises	3, 4	5	-	No
4	Quiz	3, 4	10	-	No

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Minimum Continuous Assessment Passing Requirement (%)

30

Minimum Examination Passing Requirement (%)

30

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 UNDERSTAND and ANALYZE building hydraulic systems

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

Laboratory Report

Criterion

CAPACITY to APPLY, UNDERSTAND and DISCUSS hydraulic calculation techniques to plumbing services and fire engineering systems

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

Exercises

Criterion

CAPACITY to APPLY and UNDERSTAND fire engineering systems

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

Quiz

Criterion

ABILITY to UNDERSTAND, APPLY and ANALYZE fire engineering systems

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

CAPACITY to UNDERSTAND, APPLY and ANALYZE the design and operation of building hydraulic and fire engineering systems

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

Transient flow analysis. Sewage and refuse disposal. Engineering options. Fully hydraulic calculations and analysis. Introduction to fire modeling.

Reading List**Compulsory Readings**

Title	
1	Nil

Additional Readings

Title	
1	Wise, A. F. E. & Swaffield, J. A. (5th ed.) 2002, Water, Sanitary and Waste Services for Buildings, Butterworth-Heinemann, Oxford.
2	Institute of Plumbing. 2002, Plumbing Engineering Services Design Guide, Institute of Plumbing, Hornchurch, Essex.
3	Garrett, R. H.(3rd ed.) 2008, Hot and Cold Water Supply, WileyBlackwell, West Sussex.
4	Water Supplies Department. 2025, Guide to Application for Water Supply, Water Supplies Department.
5	Water Supplies Department. 2018, Handbook on Plumbing Installation for Buildings, Water Supplies Department.
6	BSI. 2000, BS EN 12056-2 Gravity drainage systems inside buildings. Sanitary pipework, layout and calculation, BSI.
7	Fire Services Department. 2022, Codes of Practice for Minimum Fire Service Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment, Fire Services Department, Hong Kong.

8	National Fire Protection Association. 2025, SFPE Handbook of Fire Protection Engineering.
9	Loss Protection Council and Fire Protection Association. 2001, LPC Rules for Automatic Sprinkler Installations: including BS 5306, part 2 and LPC technical bulletins 1 to 33, Fire Protection Association, England.