

CA8019: FIRE SAFETY ENGINEERING FOR BUILT ENVIRONMENT I

Effective Term

Semester B 2024/25

Part I Course Overview

Course Title

Fire Safety Engineering for Built Environment I

Subject Code

CA - Civil and Architectural Engineering

Course Number

8019

Academic Unit

Architecture and Civil Engineering (CA)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

R8 - Research Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

BC8019 Fire Safety Engineering for Built Environment I

Exclusive Courses

Nil

Additional Information

Some courses offered in Summer Term may start a few weeks earlier than the normal University schedule. Please check the teaching schedules with CLs before registering for the courses.

Part II Course Details

Abstract

This course aims to provide students with in-depth theoretical base for fire science, fire dynamics and fire modelling and to further the study on the fire properties of materials in building technology.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	explore the in-depth knowledge in pyrolysis of solid, ignition phenomena, combustion mechanism, fire science and fire dynamics; list the fire characteristics and fire resistance properties of building material;				
2	evaluate the application of the advanced development and researches in fire engineering to building fires;				
3	apply the advanced development and researches techniques and mathematical models to solve fire 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.

Learning and Teaching Activities (LTAs)

LTAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures and Class Tests	Explore, evaluate and apply knowledge in pyrolysis, combustion and fire dynamics	1, 2, 3	27
2	Presentation	Assignment Presentations	3	12

Additional Information for LTAs

Semester Hours: 3 hours per week

Lecture/Tutorial/Laboratory Mix: Lecture (2); Tutorial (1); Laboratory (0)

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Assignments	1, 2, 3	50	
2	Class Tests	1	30	
3	Presentation	2, 3	20	

Continuous Assessment (%)

100

Examination (%)

0

Assessment Rubrics (AR)

Assessment Task

Assignments (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to appreciate CILO 1 to 3

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

Class Tests (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to appreciate CILO 1

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

Presentation (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to appreciate CILO 2 to 3

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 (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Ability to appreciate CILO 1 to 3

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Class Tests (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Ability to appreciate CILO 1

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Presentation (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Ability to appreciate CILO 2 to 3

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic

Failure

(F) Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Fire processes. Thermochemistry. Premixed and diffused flames. Thermal decomposition. Combustion. Compartmental fires. Building fire modeling.

Reading List**Compulsory Readings**

Title	
1	Nil

Additional Readings

Title	
1	Drysdale, D. (2011) An Introduction to Fire Dynamics, John Wiley & Sons, 3rd Edition.
2	Karlsson, B. and Quintiere J.G., (1999) Enclosure Fire Dynamics, CRC Press, 1st Edition.
3	Philip J. DiNenno (Ed.) (2002) The SFPE Handbook of Fire Protection Engineering, Society of Fire Protection Engineers, National Fire Protection Association, 3rd Edition.
4	Yeoh, G.H. and Yuen, K.K. (2009) Computational Fluid Dynamics in Fire Engineering - Theory, Modeling & Practice, Elsevier.

5	Yuen, R.K.K. (1998) Pyrolysis and Combustion of Wood in a Cone Calorimeter. PhD Thesis, University of New South Wales, Australia.
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