

# CA8020: FIRE SAFETY ENGINEERING FOR BUILT ENVIRONMENT II

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## Effective Term

Semester B 2024/25

## Part I Course Overview

### Course Title

Fire Safety Engineering for Built Environment II

### Subject Code

CA - Civil and Architectural Engineering

### Course Number

8020

### 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

BC8020 Fire Safety Engineering for Built Environment II

### 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 an understanding of the critical appraisal in current technology developments and reliability study of various fire engineering systems and to provide the students with the understanding the performance-based building fire codes and the performance-based codes for fire engineering systems.

### Course Intended Learning Outcomes (CILOs)

| CILOs | Weighting (if app.)  | DEC-A1 | DEC-A2 | DEC-A3 |
|-------|--|--------|--------|--------|
| 1     | explore and understand the performance-based building fire codes and the performance-based codes for fire engineering systems; |        |        |        |
| 2     | evaluate and analyze the reliability of various fire engineering systems;  |        |        |        |
| 3     | apply current technologies of fire engineering for the design simple fire services systems.                                    |        |        | 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 evaluation and apply performance-based fire engineering and design | 1, 2, 3<br>27              |
| 2    | Presentation             | Assignment presentation  | 2, 3<br>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 (Applicable to 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

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**Assessment Task**

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

**Criterion**

Ability to appreciate CILO 1

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**Assessment Task**

Presentation (Applicable to 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

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**Assessment Task**

Assignments (Applicable to 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

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**Assessment Task**

Class Tests (Applicable to 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

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### Assessment Task

Presentation (Applicable to 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

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## Part III Other Information

### Keyword Syllabus

Critical appraisal in current technology developments. Reliability study. Audio/visual advisory systems. Automatic actuating devices. Fire alarm systems and fire control centre. Fire detection. Performance based building fire codes. Use of computing models and computational fluid dynamic models in assisting the design of fire engineering systems. Performance-based codes for the fire engineering systems.

### 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.   |
| 6     | National Fire Protection Association (2013) National Fire Alarm and Signaling Code.   |