

Specification

Level 6 Certificate in Principles of Fire
Engineering for Construction
Professionals
(QAN: 610/7210/2Ofqual)

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1. Programme Structure and Rules of Combination

1.1. Rationale

Level 6 Certificate in Principles of Fire Engineering

The CIOB Level 6 Certificate in Principles of Fire Engineering is designed for experienced building inspectors, principal contractors, principal designers, Tier 1 contractors, the fire and rescue service, structural engineers, those managing occupied buildings and other construction professionals with responsibility for assessing and ensuring fire safety in buildings. This qualification comprises one unit and is designed to develop the learner's knowledge and skills to understand principles of fire engineering and how they apply to various roles within the construction industry.

1.2 Progression to other qualifications

This certificate is at level 6 of the Regulated Qualifications Framework (RQF) and is assigned 20 credits. Higher education providers may consider these qualifications for exemption from certain modules within their degree or other relevant programmes.

1.3 Programme Rules of Combination

To achieve the level 6 Certificate, learners are required to undertake one mandatory unit.

Total Qualification Time for the Certificate is 200 hours; 60 guided learning hours plus 140 personal study hours.

1.4 Unit Exemptions

No exemptions are offered for this qualification.

1.5 Entry Requirements

Building Inspectors, Building Approvers, the Fire and Rescue Service and other construction professionals who have demonstrable experience or who are actively engaged in a formal development pathway to be able to work on building projects that incorporate fire engineering principles.

1.6 Grading

The tutor will award the learner a grade for each unit completed (pass, merit and distinction). Unit grades apply to overall performance in units including assignments, exams, practical exercises and course work.

The overall grade for a CIOB qualification is calculated using a points system. Each unit grade attracts points as follows:

Fail	0 points
Pass	1 point
Merit	2 points
Distinction	3 points
Unit Exemption	1 point

Indicative marking descriptors for differentiating between levels of achievement when marking assignments are provided below (Section 1.8).

1.7 Assessment

The assessment is set by the approved provider and must be submitted for approval to the CIOB Awarding Organisation prior to being distributed to learners. The CIOB provides guidance and advice on the design and delivery of assessments.

All completed assessments are marked internally, internally verified and subject to external verification.

The assessment criteria cover three areas:

1. **Task Achievement** – This is a measure of how well the learner answers the task question/questions and the identification of the important aspects of the task.
2. **Technical Content** – This is a measure of how well the learner identifies, describes and evaluates the technical aspects of the task.
3. **Presentation** – This is a measure of how well the learner presents the assignment and includes the quality of the structure and paragraphing, the quality and relevance of visual or graphical content and the referencing used for quoted sources.

1.8 Indicative Marking Descriptors – Level 6 Certificate in in Principles of Fire Engineering

* Please note that the bands below describe indicative characteristics only. An overall holistic approach is required when assessing a learner's work and assigning a grade.

Grade	Task Achievement The Relevance of the Response	Inclusion of Relevant Technical Knowledge in Content	Presentation/Coherence
Distinction			
70%+	The work demonstrates a comprehensive understanding of the task. All relevant information is included. The key issues are effectively identified and analysed. There is evaluation and some analysis of solutions to issues relevant to the task. The response shows Control of content within the word count.	The work demonstrates a strong understanding of a wide range of technical issues relevant to the task. There is analysis of the advantages/disadvantages of possible choices, risks, and potential outcomes.	The work is appropriately structured, and the argument is developed coherently. There is a recognised form of source referencing which supports the points in the task. Paragraphing and titling are used effectively to assist the reader. The use of visual/graphical information is clear and effective in assisting the reader. The graphical information is relevant to the task and is accurate.
Merit			
60-69%	The work demonstrates a clear understanding of the key issues relevant to the task. The issues are explained effectively, and potential solutions identified. There is some attempt to analyse the merits of the solutions to the task. The task is broadly achieved within the word count, if relevant to the assignment.	The work demonstrates an understanding of the key technical issues of the task. There is a clear description of relevant technical aspects with some attempt to evaluate the merits of these as appropriate to the task.	Demonstrates an awareness of presentation and an attempt to present the information with clarity and coherence. There is referencing of sources and use of paragraphing and titling to assist the reader. There is use of clear graphical information to support the assignment which has broad relevance to the task. There may be some limited inaccuracies/omissions in these.
Pass			
40-59%	The work demonstrates an understanding of the task. The main points are identified, and the task is achieved. There is no attempt to evaluate or analyse the solutions. There may be some inaccuracies, omissions and irrelevant content. There may be lack of Control in relation to the word count.	The work demonstrates an understanding of the main technical issues which are identified. This may be limited to description with little evidence of evaluation. There may be some omissions and inaccuracies in the detail. There may be some irrelevant details.	There is an attempt to structure the information. There is evidence of paragraphing and titling which is not always appropriate. Some basic graphical information may be included which is of some assistance to the reader. There may be some omissions or inaccuracies. The work is generally coherent but there may be occasional lapses in coherence and structure.
Fail			
0-39%	The work shows a poor understanding of the task. Frequent inaccuracies. Failure to identify important aspects of the task. Much of the information is irrelevant to the task. There may be evidence of copy and paste from external sources. The response may be limited to lists of words with no attempt to explain the relevance/merits of these to the task. The assignment may fall short of the word count.	The work demonstrates a lack of understanding of the technical aspects. There are omissions of important technical information. Errors are evident in the technical content. There is no attempt to explain the relevance of the technical content to the task.	Lacks structure and may be limited to lists of points which are not developed. Disorganised in structure causing difficulty for the reader to understand the points. The response is Illegible or incoherent in places. No referencing of external sources. The graphical illustrations are of poor quality or absent. They may be irrelevant. There may be errors and a lack of clarity causing difficulty for the reader to understand.

1.9 Calculating Overall Qualification Grade

To calculate the overall qualification grade, the individual unit grades should be added together and compared to the table below:

1.9.1 CIOB Level 6 in Certificate in Principles of Fire Engineering Points and Grading

Learners must pass the unit of the qualification.

Total Points and final grades for Certificate	Overall Grade
6	Distinction
5	
4	Merit
3	
2	Pass
1 or fewer	Refer/Fail

1.10 Indicative Reading List

The reading can be accessed through the CIOB Library and Information Service. For further information and how to join please see the website page at this link:

<https://www.ciob.org/library>

Unit 1 – Principles of Fire Engineering for Construction Professionals

- BS 7974: 2019 Application of fire safety engineering principles to the design of buildings. Code of practice, BSI
<https://knowledge.bsigroup.com/products/application-of-fire-safety-engineering-principles-to-the-design-of-buildings-code-of-practice>
- Fire safety: Approved Document B
<https://www.gov.uk/government/publications/fire-safety-approved-document-b>
- Introduction to structural fire engineering
<https://www.istructe.org/resources/guidance/introduction-structural-fire-engineering/>
- Lennon. T., (2011). Structural fire engineering, BREPress
<https://bregroup.com/store/bookshop/structural-fire-engineering>
- Why you should comply with Regulation 38 of the building regulations
<https://bregroup.com/insights/regulation-38-and-fire-safety-engineering?>
- Stollard. P., Johnston. L., (1995). Design for fire safety: Fire safety engineering and Approved Document B (EP 36), BREPress
<https://bregroup.com/store/bookshop/design-for-fire-safety-fire-safety-engineering-and-approved-document-b-ep-36>
- Lennon. T., (2004). Structural fire engineering design: fire development, BREPress
<https://bregroup.com/store/bookshop/structural-fire-engineering-design-fire-development>
- Chitty. R., Cao. C., (2014). Computational fluid dynamics in building design: An introduction (FB 69) DOWNLOAD, BRE Electronic Publications
<https://bregroup.com/store/bookshop/computational-fluid-dynamics-in-building-design-an-introduction-fb-69-download>

- Fraser-Mitchell. J., Charters. D., (2010). Evacuation modelling and human behaviour in fire(DG 516) (DOWNLOAD), BRE Electronic Publications
<https://bregroup.com/store/bookshop/evacuation-modelling-and-human-behaviour-in-fire-dg-516>
- Grenfell’s legacy: Why accountability in fire engineering must change
<https://internationalfireandsafetyjournal.com/grenfells-legacy-why-accountability-in-fire-engineering-must-change/>
- The RIBA Plan of Work
<https://www.riba.org/work/insights-and-resources/riba-plan-of-work/>
- Building Safety Act 2022
<https://www.legislation.gov.uk/ukpga/2022/30/contents>
- Code of conduct for registered building inspectors
<https://www.gov.uk/government/publications/registered-building-inspectors-professional-codes-and-standards/code-of-conduct-for-registered-building-inspectors>
- The Building Act 1984
<https://www.legislation.gov.uk/ukpga/1984/55/contents>

1.11 Knowledge and Skills Matrix

Specialist Knowledge	Subject Knowledge and Understanding Specialist Skills	✓
Transferable Skills	Digital Skills	✓
	Analysing Information	✓
	Communication Skills	✓
	Problem Solving	✓
	Numeracy	✓
	Project Management Skills	✓

Unit 1 – Principles of Fire Engineering for Construction Professionals

Title	Principles of Fire Engineering for Construction Professionals
Unit Reference Number	X/0X0/0x0x
RQF Level	6
Credit Value	20
Unit Guided Learning Hours	60
Unit Personal Study Hours	140
Total Qualification Time	200

Learning Outcomes The Learner will:	Assessment Criteria The Learner can:
1. Understand the requirements of building legislation in relation to fire safety and how these are achieved by applying the principles and theories of fire engineering.	1.1 Examine the requirements of building legislation that relate to fire safety. 1.2 Summarise fire engineering principles and theories, show how they relate to building legislation and regulation, and the key elements required for compliance. 1.3 Compare the value of fire engineered solutions with “code” compliant solutions and explain situations when this might be appropriate.
2. Understand the purpose of the fire engineer and the processes they follow to achieve fire safety, and your role in the process.	2.1 Assess the roles, steps and parameters in the formation of fire engineered solutions. 2.2 Explain the duties and roles of stakeholders in relation to safety, where fire engineering principles have been used.
3. Be able to interpret, critically evaluate and form conclusions about fire engineered designs and solutions in order to determine compliance.	3.1 Interpret and evaluate fire engineered designs and solutions against the functional requirements of the relevant legislation and guidance. 3.2 Make conclusions on compliance of fire engineering designs and solutions that are supported by reference to relevant legislation and guidance.
4. Be able to feedback to fire engineers your conclusions and concerns.	4.1 Produce a documented response to provided fire engineering designs and solutions that outlines your conclusions and any concerns you might have. 4.2 Justify the use of fire engineering principles, designs and solutions in achieving fire safety. 4.3 Be able to provide an analytical response to provided fire engineering solutions.

Unit Information:

This Unit has been designed to provide the skills necessary to give professionals in the construction industry with responsibilities to procure, accept and work to fire engineering solutions, an appropriate understanding of the principles of fire engineering so that they might be confident in actions they undertake.

This course comprises individual presentations, led by competent industry specialists in areas that they have a particular familiarity with.

There are introductory sessions which must be completed first, the other sessions can be delivered in any order, but all form the substance of the course.

The curriculum covers topic areas such as:

- Scene setting (introduction, vocabulary, and basic understanding)
- An overview of BS 7974
- Introduction to qualitative and quantitative design
- Understanding CFD
- Smoke ventilation in residential areas
- Smoke ventilation vs smoke clearance
- Structural fire engineering
- Modern Methods of Construction
- Radiation analysis
- Accessible MOE / or working with existing buildings.