

# IFE: Level 5 Diploma in Fire Engineering Design





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## 1. Introduction

### 1.1 Qualification: IFE Level 5 Diploma in Fire Engineering Design

This document identifies courses available for delegates to achieve a Level 5 Diploma in Fire Engineering Design awarded by the IFE (Institution of Fire Engineers).

This document is designed to help individuals and organisations inform their training decisions about fire engineering courses we offer, their content, costs and methods of delivery. For more details, see Section 2.

### 1.2 Courses

The following three courses and distance learning module are required to achieve the qualification:

- i) Fire Engineering Design 1 (5 days)
- ii) Fire Engineering Design 2 (5 days)
- iii) Fire Engineering Design 3 (5 days)
- iv) Fire Engineering Design 4: Self Study Distance Learning Module

For more details, please see Section 3.

### 1.3 Target Audience

The qualification is aimed at building control officers, approved inspectors, fire engineers, fire safety auditors, inspectors, risk assessors, managers, surveyors and fire safety professionals.

It enhances previous experience in applying fire safety guidance such as Approved Document B and BS 9999 fire safety in the design, management and use of buildings.

**Note** individuals must demonstrate their suitability for attending the above courses.

### 1.4 Location and dates

**1.4.1 In-house courses:** Premises arranged by customer. Dates to be agreed.

**1.4.2 Open-courses:** See Section 8. For dates see: [www.xact.org.uk/open-course-dates-and-costs/](http://www.xact.org.uk/open-course-dates-and-costs/)

### 1.5 Booking

**1.5.1 In-house courses:** Please contact Xact on: [qualifications@xact.org.uk](mailto:qualifications@xact.org.uk)

**1.5.2 Open-courses:** Please use on-line booking: [www.xact.org.uk/open-course-dates-and-costs/](http://www.xact.org.uk/open-course-dates-and-costs/)

### 1.6 Terms and conditions

Terms and Conditions apply, please see our website link at [www.xact.org.uk/Terms\\_and\\_Conditions](http://www.xact.org.uk/Terms_and_Conditions) for a copy of our Terms and Conditions or contact us on [courses@xact.org.uk](mailto:courses@xact.org.uk) to request a copy. All orders and bookings made will be subject to our Terms and Conditions.

## 2. Qualification

## 2. Qualification

### 2.1 History

The qualification specification for Level 5 qualification Fire Engineering Design was developed by CFOA (Chief Fire Officers Association), now the NFCC (National Fire Chiefs Council) for existing fire safety professionals who work or are planning to work in the fire engineering sector.

The qualification is listed on Ofqual (Office of Qualifications and Examinations Regulation) register, qualification number is 603/2775/3.

### 2.2 Qualification

Qualification title: **IFE Level 5 Diploma in Fire Engineering Design**

The qualification is for individuals who work or intend to work in a position where they are involved in auditing or risk assessing fire engineering premises and designing or assessing fire engineering design submissions.

This Level 5 qualification is aimed at building control officers, approved inspectors, fire engineers, fire safety auditors, inspectors, fire risk assessors, managers, surveyors, architects and fire safety professionals, allowing them to work towards achieving Incorporated Engineering status IEng. See Section 2.8 for more information.

This qualification provides individuals with a practical understanding of fundamental engineering principles, enabling them to identify proven techniques and procedures to solve practical fire engineering problems and, when appropriate, to hand over to a fire engineer.

### 2.3 IFE: Institution of Fire Engineers



This qualification will be provided via the Institution of Fire Engineers. Xact is an Approved Assessment for this Awarding Body.

IFE Specification Qualification Handbook: *“Candidates should note that significant reading and self-study will also be required as attainment of this qualification requires candidates to develop awareness and understanding of an extensive range of industry-specific regulations and approved documents as well as developing underpinning understanding of relevant scientific and engineering principles.”*

### 2.4 Options for qualification

#### 2.4.1 Courses

See Section 3 for details about the three courses and distance learning module to achieve this qualification.

## 2. Qualification

### 2.4.2 RPL: Recognition of Prior Learning

Please contact us on [qualifications@xact.org.uk](mailto:qualifications@xact.org.uk) for more information

### 2.5 Qualification structure

- i) Ten mandatory Level 5 units
- ii) 230 guided learning hours (GLH)
- iii) 370 total qualification time (TQT)

**Note 1:** Guided learning hours (GLH): The number of hours with specific guidance towards learning.

**Note 2:** Total qualification time (TQT): GLH plus the number of hours a learner will reasonably be likely to spend in preparation, study or any other form of participation in education or training, including assessment.

#### 2.5.1 Qualification Units

Unit	Unit title	Credit	TQT	GLH
1	Principles of Fire Development and Spread	2	20	10
2	Principles of Fire Engineering	6	60	40
3	Review the Effectiveness of Automatic Fire Suppression Systems	7	70	50
4	Fire Engineering Design and its Impact on Human Behaviour	3	30	20
5	Fire Engineering Design and its Impact on the Fire Resistance of Materials and Structures	3	25	20
6	Smoke Control and Heat Exhaust Ventilation Systems	6	60	30
7	Pressure Differential Systems	5	45	30
8	Fire Engineering Design and its Impact on the External Spread of Fire	2	20	10
9	Fire Engineering Design and its Impact on Access and Facilities for Fire-Fighting	2	20	10
10	Principles of Fire and Evacuation Modelling	2	20	10

### 2.6 Qualification requirements

A level 5 qualification requires delegates to demonstrate they possess the following knowledge and skill:

#### 2.6.1 Knowledge requirement

- a) Practical, theoretical or technological knowledge and understanding of a subject or field of work to find ways forward in broadly defined, complex contexts.
- b) Ability to analyse, interpret and evaluate relevant information, concepts and ideas.
- c) Awareness of the nature and scope of the area of study or work.
- d) Informed awareness of different perspectives or approaches within the area of study or work.
- e) Ability to understand different perspectives, approaches or schools of thought and the reasoning behind them.

## 2. Qualification

### 2.6.2 Skills requirement

- a) Determine, adapt and use appropriate methods, cognitive and practical skills to address broadly defined, complex problems.
- b) Use relevant research or development to inform actions.
- c) Evaluate actions, methods and results.

## 2.7 Course route to qualification

### 2.7.1 Course entry requirement

Individuals who wish to attend the Level 5 Fire Engineering Design courses must demonstrate that they have the appropriate knowledge, understanding and experience to attend. Examples of suitable experience includes:

- a) Work place experience applying ADB and BS 9999, *or*
- b) Similar and relevant work place experience, *or*
- c) Level 4 Diploma in Fire Safety, *or*
- d) Similar and relevant qualification/s

### 2.7.2 Study commitment

To complete this qualification you are committing to a programme of study of 230 GLH (Guided Learning Hours) which consists of a wide variety of activities:

- a) Attending courses
- b) Self-study and research:
  - i) Reading course reference material
  - ii) Viewing online videos
- c) Application of learning and writing assignments

The programme consists of 100 hours attending courses with the remainder being from self-study, research, application of learning and written assignments. See also Section 2.3.

### 2.7.3 Learning agreement

To ensure delegates and their organisations understand the commitment required for the Level 5 qualification, Xact invites them to enter into a learning agreement.

Each delegate is required to return a copy of the learning agreement to Xact, signed by both them and their sponsoring organisation.

## 2.8 Professional Accreditation

Two professional accreditation routes are available to those who achieve the Level 5 Diploma in Fire Engineering Design:



## 2. Qualification

### 2.8.1 Engineering Technician (EngTech)

Engineering Technicians (EngTech) apply safe systems of work and contribute to either the design, development, manufacture, commissioning, decommissioning, operation or maintenance of products, equipment, processes or services.

For information about Engineering Technician (EngTech) see:

Fire Engineering Council: <https://www.engc.org.uk/engtech>

Institution of Fire Engineers: <https://www.ife.org.uk/Join/EngineeringTechnician>

### 2.8.2 Incorporated Engineer (IEng)

Incorporated Engineers (IEng) maintain and manage applications of current and developing technology and may undertake engineering design, development, manufacture, construction and operation (see Engineering Council website).

To achieve professional accreditation as an Incorporated Engineer, individuals will also need to demonstrate that they have achieved maths at an advanced level e.g. a maths degree.

For information about Incorporated Engineer (IEng) see:

Fire Engineering Council: <https://www.engc.org.uk/ieng>

Institution of Fire Engineers: <http://www.ife.org.uk/Join/IncorporatedEngineer>

## 2.9 Fire Engineering Degrees



University for the Common Good

Glasgow Caledonian University admissions department recognises Xact's Level 5 Diploma in Fire Engineering Design as acceptable for entry onto their BEng Hons Degree at Part Time 3. This is entry level in London and Level 2 in Glasgow and would entail three years of part-time study to achieve the honours degree. Part-time applicants are required to be employed or self-employed in a relevant field. For more details contact the university directly.

Xact is currently developing arrangements with other universities offering fire engineering degrees.

## 3. Fire Engineering Design Courses

# 3. Fire Engineering Design Courses

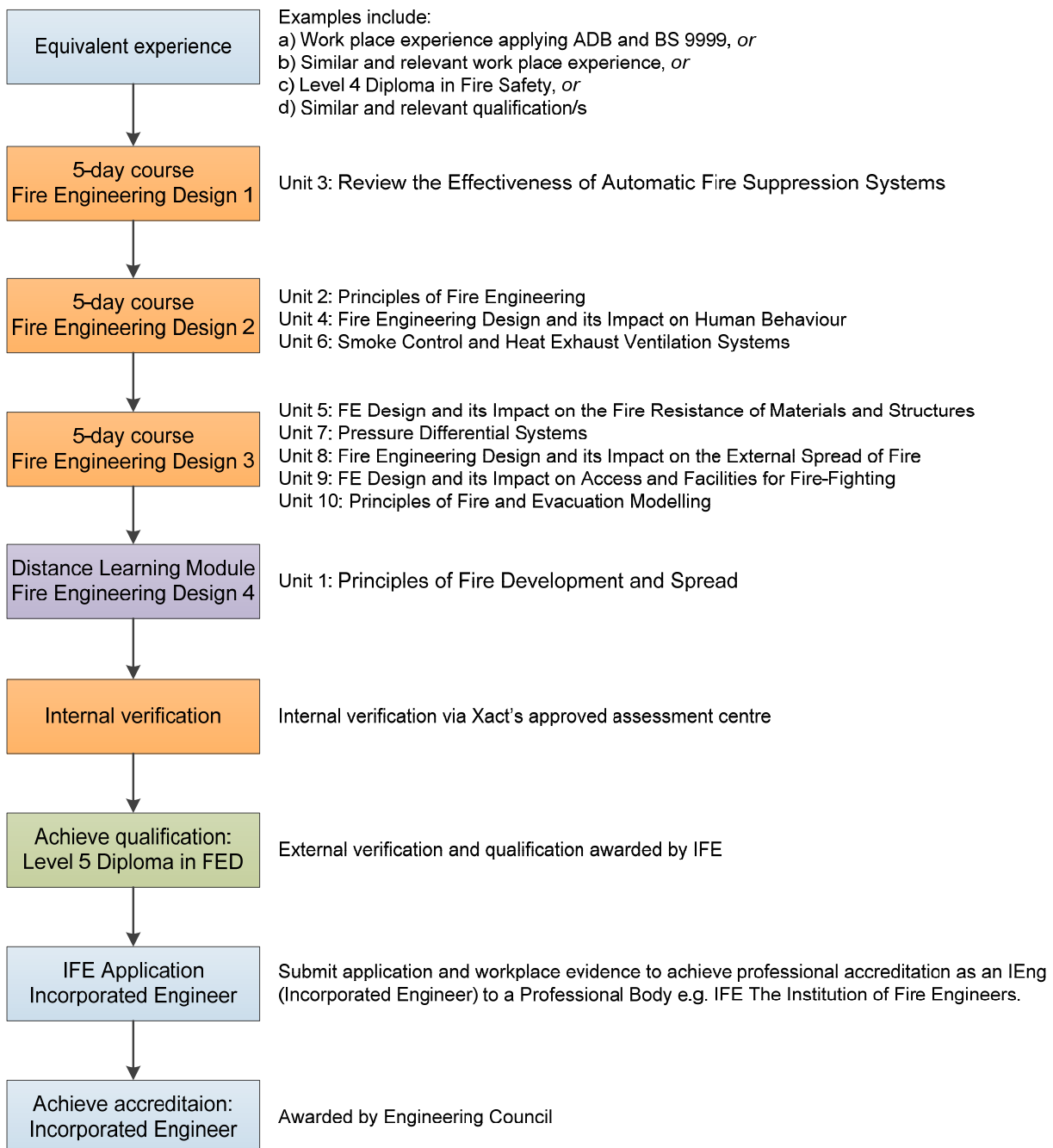
### Introduction

The 10 qualification units are achieved via:

- a) Previous experience to ensure suitability for attending courses
- b) Completion of course work, course assignments and distance learning module

### Qualification and Professional Accreditation flowchart

#### IFE: Level 5 Diploma in Fire Engineering Design



## 3.1 Course: Fire Engineering Design 1

### 3.1 Fire Engineering Design 1

**Target audience**

Aimed at those who work or intend to work in a position of responsibility for assessing the existing fire engineering arrangements in buildings, this course is for building control officers, approved inspectors, fire engineers, fire safety auditors, inspectors, risk assessors, managers, surveyors and fire safety professionals.

**Aim**

First of three courses to enable delegates to design fire engineering solutions or assess fire engineering design submissions.

**Qualification units**

- Unit 3: Review the Effectiveness of Automatic Fire Suppression Systems

**Core content**

In-depth study and research into:

- Principles of automatic fire suppression systems
- Residential and domestic sprinklers: BS 9251
- Residential water mist systems: NFPA 750, BS 8458
- Commercial sprinklers: BS EN 12845
- LPC Sprinkler rules and ESFR: Early Suppression Fast Response Fire Sprinkler Systems
- Hazard review of commercial sprinkler systems
- Commercial water mist systems: NFPA 750, BS 8489
- Oxygen Reduction Fire Prevention Systems: BS EN 16750
- Gaseous and foam systems: BS EN 1365-9: Foam systems
- Case studies of Automatic Fire Suppression Systems

**Duration**

5 days

**Delivery**

Sessions will be delivered using PowerPoint, flipchart, group discussion, videos, individual tuition and practical exercises.

**Course assessment**

Assessment of all course work is to the qualification assessment criteria.

### 3.1 Course: Fire Engineering Design 1

**Post course**

Delegates must complete course work within six weeks of course completion.

**Prior learning**

This course is part of a qualification to enable attendees to develop an understanding of fire engineering at technician level. It is a natural progression from achieving qualification: Level 4 Diploma in Fire Safety (Fire Inspectors) or an equivalent qualification or experience.

Delegates must have an in-depth working knowledge of the functional requirements of the building regulations and fire safety guidance documents such as Approved Document B, Volume 2 and BS 9999 fire safety in the design, management and use of buildings.

**Note** Individuals must demonstrate their suitability for attending this course.

## 3.2 Fire Engineering Design 2

**Target audience**

Aimed at those who work or intend to work in a position of responsibility for assessing the existing fire engineering arrangements in buildings, this course is for building control officers, approved inspectors, fire engineers, fire safety auditors, inspectors, risk assessors, managers, surveyors and fire safety professionals.

Those who have completed Fire Engineering Design 1 course.

**Aim**

Second of three courses to enable delegates to design fire engineering solutions or assess fire engineering design submissions.

**Qualification units**

- Unit 2: Principles of Fire Engineering
- Unit 4: Fire Engineering Design and its Impact on Human Behaviour
- Unit 6: Smoke Control and Heat Exhaust Ventilation Systems

**Core content**

In-depth study and research into:

- BS 7974 Application of fire engineering principles
- Tenability principles
- Principles of smoke obscuration/visibility
- Human behaviour in fire
- QDR: Qualitative Design Review
- Fire engineering design and consultations
- Probabilistic risk assessment
- Business impact assessment
- ASET – RSET timelines
- Fire Safety management and control procedures
- Interactions between fire safety systems
- Design fires and radiation shape factors
- SHEVS: Smoke and heat exhaust ventilation systems
- Commissioning, testing and maintenance programmes

**Duration**

5 days

## 3.2 Course: Fire Engineering Design 2

### **Delivery**

Sessions will be delivered using PowerPoint, flipchart, group discussion, videos, individual tuition and practical exercises.

### **Course assessment**

Assessment of all course work is to the qualification assessment criteria.

### **Post course**

Delegates must complete course work within six weeks of course completion.

### **Prior learning**

Delegates must have completed course: Fire Engineering Design 1.

## 3.3 Fire Engineering Design 3

**Target audience**

Aimed at those who work or intend to work in a position of responsibility for assessing the existing fire engineering arrangements in buildings, this course is for building control officers, approved inspectors, fire engineers, fire safety auditors, inspectors, risk assessors, managers, surveyors and fire safety professionals.

Those who have completed the Fire Engineering Design 2 course.

**Aim**

Final of three courses to enable delegates to design fire engineering solutions or assess fire engineering design submissions.

**Qualification units**

- Unit 5: FE Design and its Impact on the Fire Resistance of Materials and Structures
- Unit 7: Pressure Differential Systems
- Unit 8: Fire Engineering Design and its Impact on the External Spread of Fire
- Unit 9: FE Design and its Impact on Access and Facilities for Fire-Fighting
- Unit 10: Principles of Fire and Evacuation Modelling

**Core content**

- BS 7974 Application of fire engineering principles
- Radiation shape factors
- Applying fire engineering to the functional requirements of the building regulations:
  - B2: Internal fire spread (linings)
  - B3: Internal fire spread (structure)
  - B4: External fire spread
  - B5: Access and facilities for FRS
- Series and parallel pressure differential systems
- Principles of fire and evacuation modelling

**Duration**

5 days

**Delivery**

Sessions will be delivered using PowerPoint, flipchart, group discussion, videos, individual tuition, practical exercises and software programmes.

### 3.3 Course: Fire Engineering Design 3

**Course assessment**

Assessment of all course work is to the qualification assessment criteria.

**Post course**

Delegates must complete course work within six weeks of course completion.

**Prior learning**

Delegates must have completed course: Fire Engineering Design 2.



## 3.4 Distance Learning: Fire Engineering Design 4

**Target audience**

Aimed at those who work or intend to work in a position of responsibility for assessing the existing fire engineering arrangements in buildings, this course is for building control officers, approved inspectors, fire engineers, fire safety auditors, inspectors, risk assessors, managers, surveyors and fire safety professionals.

Those who have completed the Fire Engineering Design 3 course.

**Aim**

Final of three courses to enable delegates to design fire engineering solutions or assess fire engineering design submissions.

**Qualification units**

- Unit 1: Principles of Fire Development and spread

**Core content**

- Explain the principles of fire development
- Explain how fires are initiated and develop within enclosure of origin
- Explain how smoke and toxic gases spread within and beyond enclosure of origin

**Distance learning**

This module requires delegates to conduct research and self-study.

**Course assessment**

Assessment of all course work is to the qualification assessment criteria.

**Post course**

Delegates must complete course work within four weeks of issue.

**Prior learning**

Delegates must have completed course: Fire Engineering Design 3.

## 4. In-house and open course costs

Course	Duration	In-house	Open
Fire Engineering Design 1	5 days	8,900	890
Fire Engineering Design 2	5 days	8,900	890
Fire Engineering Design 3	5 days	8,900	890
Fire Engineering Design 4: Distance Learning Module	DL	0 <sup>1</sup>	0 <sup>1</sup>

<sup>1</sup> Cost included when attending previous three courses.

Individual unit costs		Duration	Course	Day	Open
1	Principles of Fire Development and Spread	DL	NA	NA	150
2	Principles of Fire Engineering	2 days	2	1-2	500
3	Review the Effectiveness of Automatic Fire Suppression Systems	5 days	1	1-5	890
4	Fire Engineering Design and its Impact on Human Behaviour	1 day	2	2	250
5	Fire Engineering Design and its Impact on the Fire Resistance of Materials and Structures	1 day	3	1	200
6	Smoke Control and Heat Exhaust Ventilation Systems	3 days	2	3-5	600
7	Pressure Differential Systems	2 days	3	4-5	450
8	Fire Engineering Design and its Impact on the External Spread of Fire	1 day	3	2	200
9	Fire Engineering Design and its Impact on Access and Facilities for Fire-Fighting	1 day	3	3	200
10	Principles of Fire and Evacuation Modelling	1 day	3	5	250

### Qualification fees

Unit accreditation (per unit), see notes 2 + 3	25
Qualification	60

## 4. Costs

### Re-submission fees

The following additional fees apply when a re-submission is required.

Amount re-submissions required	Additional fee
0% - 20%	0
21% - 40%	100.00
41% - 60%	150.00
Over 61%	200.00

### Notes:

**Note 1: Delegate suitability:** Individuals must demonstrate their suitability for attending these courses.

**Note 2: Individual unit costs:** For those who wish to achieve a qualification unit accreditation only.

**Note 3: Unit accreditation:** A fee for those not working towards the complete qualification, but wish to receive an awarding body certificate confirming they have successfully completed a unit.

### Note 4: In-house courses:

- i) **Inclusive cost:** For course e.g. notes, guidance documents, exercises, tutor travelling and accommodation. See iv) below.
- ii) **Teaching facilities:** Does not include teaching facilities provided by customer. See Appendix B.
- iii) **Delegate numbers:** Maximum 14 delegates for in-house courses.
- iv) **Additional costs:** These will be charged at cost and are incurred for:
  - If tutor car parking and refreshments are unavailable.
  - Extended travel e.g. flights to Channel Islands, Isle of Man, Northern Ireland and Eire. Extended. Extended travel to remote locations. Please contact us to confirm.

**Note 5: Open courses:** Cost includes teaching facilities, refreshments and lunch during teaching day. Additional charge for bed, breakfast and evening meal – see below.

**Note 6: Open courses** are normally located at Ettington Chase Conference Centre, Banbury Road, Ettington, Stratford-upon-Avon, Warwickshire CV37 7NZ

**Note 7: Open courses: Overnight accommodation** with en-suite facilities is available at Ettington Chase at £67 for bed, breakfast and evening meal. **Note** Sunday night rate is £55 because it does not include an evening meal. Individuals can purchase meals from the restaurant if required.

**Note 8: Open courses** are also provided at other locations. Accommodation charges at these venues will differ from those quoted above.

**Note 9: VAT** will be added at the current rate.

**Note 10: Payment terms:** Within 30 days of invoice date for customers with a suitable credit rating, or one month prior to course commencement.

## 5. Distance Learning

### 5. Distance Learning

Delegates need the following resources to complete on-line distance learning options:

- Computer with internet access
- Adobe reader software
- Access to a printer

#### **Distance learning module**

When part of the course is completed on-line by pre-course study or post course assignment or both:

#### **On-line courses**

Delegates are provided with:

- Online course guide to the module
- Reading material for course
- Module work book for completion before course commences

**Note:** Delegates will have to obtain copies of copyrighted material e.g. British Standards, through their own organisations.

#### **Post course assignment**

Delegates are provided with all resources during the course. They complete the last phase in their workplace, a Workplace fire risk assessment or audit.

## 6. Teaching facilities for courses

### 6. Teaching facilities for in-house courses

**All courses:**

Require a main teaching room with following facilities:

- Delegate chairs and desks (minimum 0.75m x 0.75m per delegate)
- Tutor table and chair
- Whiteboard, dry marker pens and eraser (or flipchart)
- Data projector for PowerPoint and videos with either:
  - Computer which can upload PowerPoint from a memory stick, *or*
  - Connection for laptop
- Projection screen for data projector
- 240v electrical supply for laptop
- Tutor and teaching staff refreshments during teaching day

## 7. Course support information

### 7. Course support information

#### **National Occupational Standards and IPDS modules**

Courses are designed to cross-map with the relevant qualification units.

#### **Legislation, British Standards and technical guidance documents**



Delegates have access to a wide range of Technical Guidance, British Standards, best practice and reference material on courses. Hard copies for classroom work and on-line versions for distance learning and study programmes are available.

#### **Approved Assessment Centre and National Awarding Bodies**

Xact is an Approved Assessment Centre and provides qualifications via national awarding bodies. We are externally audited by the awarding bodies which are regulated by OFQUAL, the regulator of qualifications, examinations and assessments.

#### **Continual Professional Development**

All delegates receive CPD certificates on course completion. All courses are designed and assessed to approved centre standards.

#### **Courses**

Courses consist of three phases:

- Learning – acquiring knowledge, understanding and skills
- Practising learning – using real-life reconstructions designed to replicate workplace activities of delegates
- Comprehensive debrief – to confirm learning

#### **Delegate numbers**

Xact restricts delegate numbers to allow an optimal level of interaction between delegates and tutor. This provides delegates with the best opportunity to achieve learning outcomes

#### **Assessment**

Courses are assessed. Assessment standards are based on OFQUAL and awarding body requirements.

## 8. Open courses: Ettington Chase Conference Centre

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### Ettington Chase Conference Centre

Reception: 01789 740000

Banbury Road, Ettington, Stratford-upon-Avon, Warwickshire CV37 7NZ

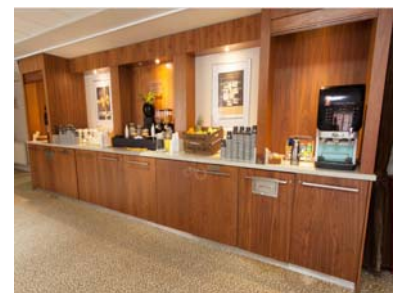
Free on-site parking

**Booking enquiries:** Xact Training

01386 277980 [courses@xact.org.uk](mailto:courses@xact.org.uk)



Training rooms



Refreshment area



Library



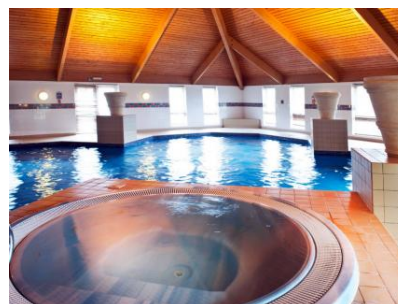
Restaurant



Lounge, Costa, bar and Sky Sports



En-suite bedroom with: Wi-Fi, desk, multi-channel TV, tea, coffee making and ironing facilities



Heated swimming pool, spa pool and sauna. Air conditioned gym offering cardiovascular and weight machines. Outside there is a tennis court and lots of on-site walks.



## 8. Open courses: Ettington Chase Conference Centre

Road connections	Easy access from M40: J15: 10 miles, J13: 9 miles, J12: 11 miles
Train stations	Warwick Parkway (WPS) 12m or Banbury (BS) 14m: Chiltern Line stations with direct connections to London Marylebone, Birmingham, Kidderminster and Oxford
Airports	Birmingham Airport (BA): 28 miles, London Luton Airport: 68 miles
Taxi	Grafton Taxis (pre-arranged), 01789 267009. BA: £67, BS: £38, WPS: £30

### Ettington Chase Conference Centre

Banbury Road, Ettington, Stratford-upon-Avon, Warwickshire CV37 7NZ



**Ettington Chase**



## 9: Xact Consultancy and Training Limited

Company Registration No: 05295715  
VAT Registration No: 855 4570 04  
Web site: [www.xact.org.uk](http://www.xact.org.uk)  
Email: [info@xact.org.uk](mailto:info@xact.org.uk)

### **Insurance**

Xact are insured for:  
  
Public and Employers Liability  
Professional Indemnity

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Worcestershire  
WR11 4BY

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