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Fire Division
消防分部

Route to Become a Fire Engineer

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Fire Division
消防分部

Fire Engineering Projects in Hong Kong

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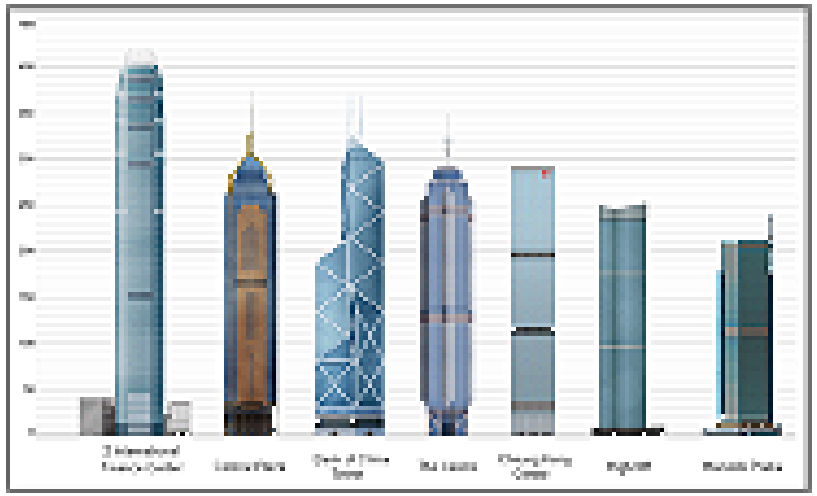
Fire Division
消防分部

Skyscrapers in HK

- International Commerce Centre - 490m
- International Finance Centre - 406.9 m
- Central Plaza – 309 m
- Bank of China – 305 m
- The Center – 292 m
- Cheung Kong Centre – 283 m
- And many others …….



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Fire Division 消防分部

International Commerce Centre

- Super high-rise building
- Mixed uses (hotel with restaurants, observation deck, offices, entrance lobby, car parks)
- Linking to retail complex
- Over 10,000 persons in capacity
- Central stairs / lifts core
- Large Atrium - “Dragon Tail”

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Fire Division
消防分部

Fire Engineering Approach

Fire engineering design offers a flexible alternative:-

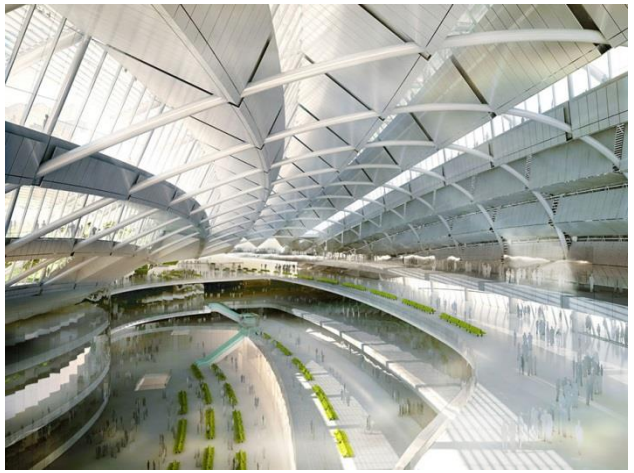
- where it is impracticable to comply with prescriptive provisions;
- when designing for special or large and complex buildings;
- alteration and addition works in existing buildings.

Aims

- Equivalent or enhanced fire safety achieved through full compliance with the prescriptive provisions.

West Kowloon Station

Atrium



Gross Floor Area
~ 380,000 m^2

4 main underground floor levels (B1 to B4) accommodating:

- Customs, Immigration and Quarantine (CIQ) facilities
- Departure lounges
- Passenger arrival and departure halls
- Duty-free outlets
- Food and beverage outlets
- Station parking and loading facilities

Grand Atrium

- Long throw sprinklers
- Dynamic Smoke extraction system/ Auto open make up air windows
- Fully addressable fire detection system
- Fire rated structural elements

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Fire Division
消防分部

Fire Discipline

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Fire Division
消防分部

The Fire Discipline of HKIE

- Recognized Fire as an emerging engineering discipline
- Established in November 2005

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Fire Division
消防分部

The Fire Division of HKIE

The Fire Division of HKIE

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Fire Division 消防分部

- Established in June 2008;
- Mission:-
  - to serve as a platform to bring together stakeholders and professionals from both the local industry and international fire arenas;
  - to share their vast array of knowledge and experience in order that we can serve our communities with the best collective wisdom built on the latest research data, most advanced simulation techniques and also most importantly new ways of thinking.

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香港工程師學會
Fire Division
消防分部

Objectives

a) advance the science, technology and practice of Fire Engineering;

b) facilitate the exchange of information and ideas in relation to Fire Engineering;

c) raise the image and standing of Fire Engineers; and

d) foster a spirit of friendly collaboration within and outside the Institution.

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Fire Division
消防分部

Admission Requirements for the Fire Discipline

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Fire Division
消防分部

Six Domains of Fire Engineering

- Fire Science
- Human Psychology and Physiology
- Active Fire Protection Systems Analysis
- Passive Fire Protection Systems Analysis
- Law, Regulations and Standards
- Fire Risk Management

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香港工程師學會
Fire Division
消防分部

Academic Requirements

To satisfy either one of the following:-

Normally

a)A first engineering degree (Honours) accredited by the Institution relevant to the Discipline: or

b)An accredited first engineering degree as listed in the Washington Accord relevant to the Discipline and maintained by the Institution; or

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香港工程師學會
Fire Division
消防分部

Academic Requirements

Topping up

c)other recognized Honours degree level qualifications in engineering with “top up” by extra academic study during the training period or working experiences as approved by the DAP.

Individual Assessment

d)other non-recognized Honours degree level qualifications may be considered for the class of Member based on an individual assessment.

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香港工程師學會
Fire Division
消防分部

Professional Training & Experience

For Candidates satisfying academic requirements in (a) and (b) above :

a)2-year recognised Scheme A training followed by 2- year responsible experience; or

b)5-year General Experience training followed by 1- year responsible experience

Topping up

c)Candidates may undertake topping-up by extra academic studies during the training experience or extra 2-year working experience in addition to the above training and experience requirements.

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香港工程師學會
Fire Division
消防分部

Professional Assessment

1. Report of 1600 to 2000 words on Training and experience together with the relevant drawings and documents attached to the application form in English

2. Interview

3. Essay of about 1600 words to be written after the interview in English on a given topic (two hours allowed)

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Fire Division
消防分部

Engineering Degrees accredited by HKIE relevant to the Discipline

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香港工程師學會
Fire Division
消防分部

CituU

i. BEng (Hons) in Building Engineering (Building Services Engineering)(UGC Funded Full-time)

ii. BEng (Hons) in Building Engineering (Building Services Engineering)(Self-financing Part-time)

iii. BEng (Hons) in Building Engineering (Building Services Engineering)(Law Minor)(UGC Funded Full-time)

iv. BEng (Hons) in Building Services Engineering(UGC Funded Full-time)

v. BEng (Hons) in Building Engineering (Modern Structural Engineering)(UGC Funded Full-time)

vi. BEng (Hons) in Building Engineering (Structural and Geotechnical Engineering)(UGC Funded Full-time)

THE HONG KONG INSTITUTION OF ENGINEERS
香港工程師學會
Fire Division
消防分部

CityU

vii. BEng (Hons) in Building Engineering (Structural and Geotechnical Engineering)(Self-financing Part-time)

viii. BEng (Hons) in Civil and Structural Engineering (UGC Funded Full-time)

- For programmes (i) to (iv), graduates who completed successfully (a) the two courses: Fire Engineering Elective I and Fire Engineering Elective II or (b) the two courses: Fire Science and Modelling and Fire Engineering Approach, top up is not required.

- Otherwise, topping up studies not less than 96 contact hours required. Suggested top up modules - Fire and Built Environment (FV2003) and Enclosure Fire Dynamics (FV3001) from CityU SCOPE.

THE HONG KONG INSTITUTION OF ENGINEERS
香港工程師學會
Fire Division
消防分部

PolyU

i. BEng (Hons) in Building Services Engineering (UGC-funded Full-time and Sandwich)

ii. BEng (Hons) in Building Services Engineering (2-Year Self-financed Full-time)

iii. BEng (Hons) in Building Services Engineering (4-Year Self-financed Part-time)

iv. BEng (Hons) in Building Services Engineering (with specialism in Fire Engineering) (Self-financed Full or Part-time)

v. BEng (Hons) in Civil and Structural Engineering (UGC-Funded Full-time and Sandwich)

vi. BEng (Hons) in Civil and Structural Engineering (Self-financed Part-time)

vii. BEng (Hons) in Civil and Environmental Engineering (UGC-Funded Full-time)

viii. BEng (Hons) in Civil Engineering (UGC-Funded Full-time and Sandwich)

THE HONG KONG INSTITUTION OF ENGINEERS
香港工程師學會
Fire Division
消防分部

PolyU

ix. BEng (Hons) in Civil Engineering (Self-financed Part-time)

- For programmes (i) to (iii), topping up studies not less than 96 contact hours required. Suggested top up modules - Fire and Built Environment (FV2003) and Enclosure Fire Dynamics (FV3001) from CityU SCOPE.
- For course (iv), top up not required.
- For programmes (v) to (ix), topping up studies not less than 240 contact hours required. Suggested top up modules - Introduction to Combustion and Fire (FV1001), Fire and Built Environment (FV2003), Enclosure Fire Dynamics (FV3001), Fire Protection Engineering (FV3002) and Engineering Design Project (FV3201) from CityU SCOPE.

THE HONG KONG INSTITUTION OF ENGINEERS
香港工程師學會
Fire Division
消防分部

HKUST

i. BEng (Hons) in Civil and Structural Engineering (including Civil and Environmental Engineering) (Full time)

ii. BEng (Hons) in Mechanical Engineering (Full time)

- For programme (i), topping up studies not less than 240 contact hours required. Suggested top up modules - Introduction to Combustion and Fire (FV1001), Fire and Built Environment (FV2003), Enclosure Fire Dynamics (FV3001), Fire Protection Engineering (FV3002) and Engineering Design Project (FV3201) from CityU SCOPE.
- For programme (ii), topping up studies not less than 192 contact hours required. Suggested top up modules Fire and Built Environment (FV2003), Enclosure Fire Dynamics (FV3001), Fire Protection Engineering (FV3002) and Engineering Design Project (FV3201) from CityU SCOPE.

THE HONG KONG INSTITUTION OF ENGINEERS
香港工程師學會
Fire Division
消防分部

HKU

i. BEng (Hons) in Mechanical Engineering (Building Services Engineering) (Full-time and Sandwich) [formerly named BEng (Hons) in Building Services Engineering (Full-time and Sandwich)]

ii. BEng (Hons) in Mechanical Engineering (Full –time and Sandwich)

- For programme (i), topping up studies not less than 96 contact hours required. Suggested top up modules - Fire and Built Environment (FV2003) and Enclosure Fire Dynamics (FV3001) from CityU SCOPE.

- For programme (ii), topping up studies not less than 192 contact hours required. Suggested top up modules - Fire and Built Environment (FV2003), Enclosure Fire Dynamics (FV3001), Fire Protection Engineering (FV3002) and Engineering Design Project (FV3201) from CityU SCOPE.

THE HONG KONG INSTITUTION OF ENGINEERS
香港工程師學會
Fire Division
消防分部

HKU

i. BEng (Hons) in Mechanical Engineering (Building Services Engineering) (Full-time and Sandwich) [formerly named BEng (Hons) in Building Services Engineering (Full-time and Sandwich)]

ii. BEng (Hons) in Mechanical Engineering (Full –time and Sandwich)

- For programme (i), topping up studies not less than 96 contact hours required. Suggested top up modules - Fire and Built Environment (FV2003) and Enclosure Fire Dynamics (FV3001) from CityU SCOPE.

- For programme (ii), topping up studies not less than 192 contact hours required. Suggested top up modules - Fire and Built Environment (FV2003), Enclosure Fire Dynamics (FV3001), Fire Protection Engineering (FV3002) and Engineering Design Project (FV3201) from CityU SCOPE.

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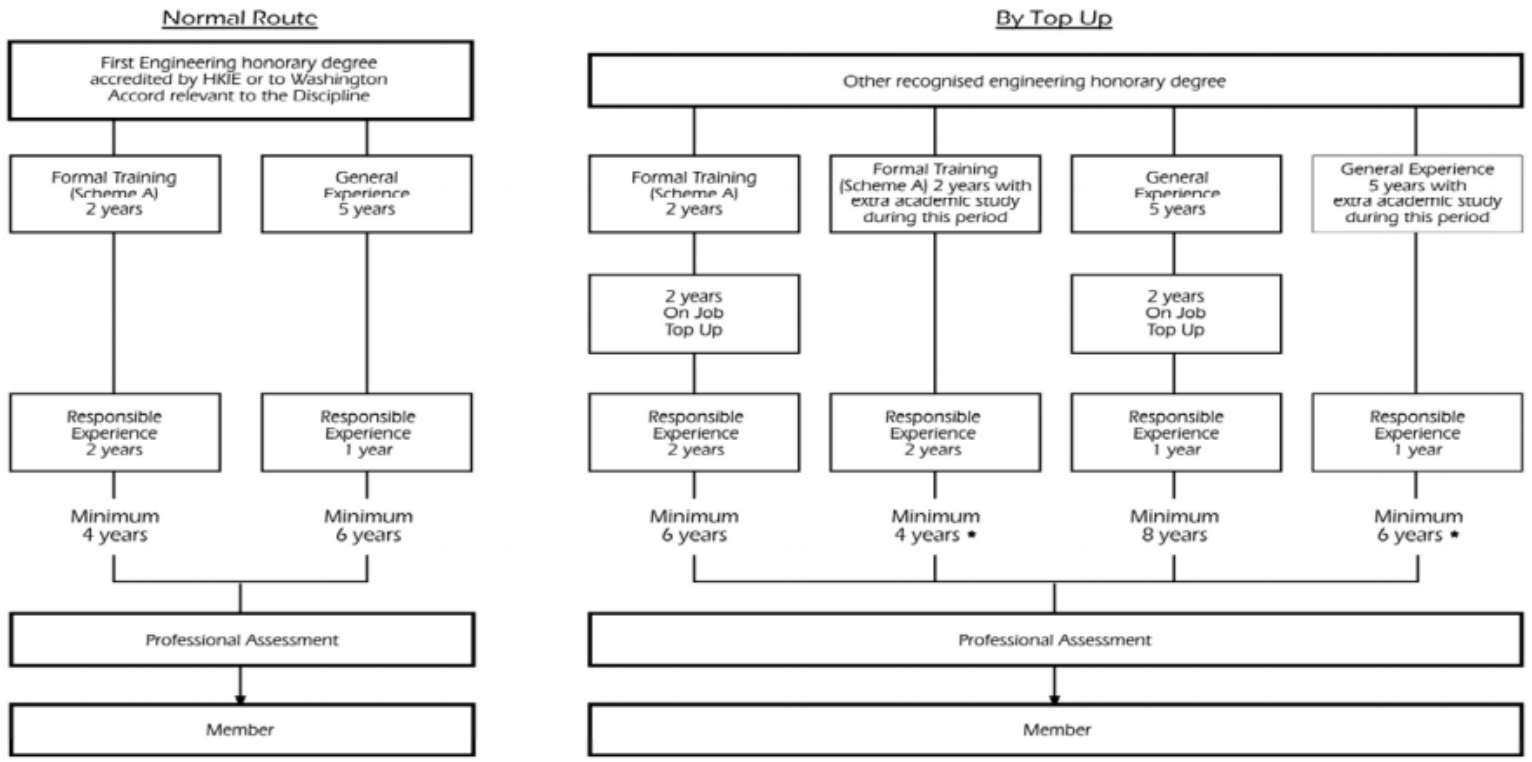
Fire Division
消防分部

Routes to Membership



* The minimum period of 4 years or 6 years may be extended if the academy top up study occurs after the 2-year Formal Training Period for scheme A or 5-year General Experience Period for General Experience Route

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香港工程師學會

Fire Division
消防分部

FRE Admission Requirements

HKIE Website → Members → Download → Membership

Information on Admission to Specific Discipline via Professional Assessment

Admission Requirements for the Fire Discipline

http://www.hkie.org.hk/upload/download/21/file/59c1caf58f09a.pdf

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香港工程師學會

Fire Division
消防分部

Reciprocal Recognition Agreement (RRA) between IFE and HKIE

THE HONG KONG INSTITUTION OF ENGINEERS
香港工程師學會
Fire Division
消防分部

Reciprocal Recognition

- The engineering profession in the United Kingdom is regulated by the Engineering Council.
- Putting suitably qualified person on the Engineering Council's Register of Engineers via **licensed engineering institutions**.
- IFE → a **licensed member** of the Engineering Council.
- To register members that are qualified as

a) Chartered Engineers (CEng);

b) Incorporated Engineers (IEng); or

c) Engineering Technicians (EngTech).

Engineering Council

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香港工程師學會
Fire Division
消防分部

Reciprocal Recognition

- Agree that criteria and requirements for granting MHKIE in FRE and CEng IFE are substantially equivalent
- Agreement signed between IFE and HKIE on 13 SEP 2013
- For MHKIE in FRE and CEng IFE to be accorded corresponding membership of the other Institution on receipt of an acceptable application
- Applicants who have obtained their substantive training and experience in a jurisdiction shall apply for Membership in that jurisdiction first. If these applicants wish to apply for Membership in another jurisdiction first, their submissions under the Agreement could be subject to a review which may comprise: training & experience report; interview; essay test; record of CPD

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香港工程師學會

Fire Division
消防分部

Becoming a Chartered Engineer (CEng)

Chartered Engineer

Becoming a Chartered Engineer (CEng) via the Institution of Fire Engineers

Young Wong
PhD RPE MHKIE CEng FIFireE

ARUP

Eligibility for CEng

- The CEng title is open to anyone who can demonstrate the required professional competences and commitment, as set out in the professional standard **UK-SPEC**.
- Individuals generally develop these through education and working experience.
- For those with exemplifying academic qualifications:
  - A Bachelors degree, with Honours, in engineering or technology, accredited for CEng, plus an appropriate and accredited Masters degree or Engineering Doctorate (EngD), or appropriate further learning to Masters level; or
  - An accredited integrated MEng degree

Steps for Professional Registration

Record your professional development

- To gain and maintain professional registration with the Engineering Council you need to record your professional development.
- This provides a body of evidence on your qualifications, activities and experience for you to draw on when you are ready to apply for your chosen title.

Assessment - the professional review

- Known as the **professional review**.
- This starts with a **written application**, which may vary depending on the requirements of your institution.
- For CEng registration, there is also a **professional review interview**.

HKIE

- **M3 Route to Membership**
- https://www.hkie.org.hk/docs/downloads/membership/forms/M3.pdf
- Section 4 – Professional Assessment
- Application form – From 1/M
- 4 supporting signatures (1 fellow + 2 same discipline)

IFireE CEng

- http://www.ife.org.uk/Join/Chartered-Engineer
- **8-4 IPD Objectives for CEng v4** (Issued 05/16)
- Professional Review Report
- 8-2 CEng Application Form v5 (Issued 12/11)
- 2 supporting signatures

HKIE

- Academic Requirements
  - HK BEng / Overseas Master
- Formal Training Route
  - Scheme A Logbook
  - 2 years after Scheme A
  - Common core/ Core/ Specific objective
- Continuing Professional Development (CPD)
  - 45 hours per year (all previous years)
- Working Experience ~ 4 years minimum

IFireE

- Academic Requirements
  - Master Degree
- Standard Route for IFireE
  - Reference 5 years experience
  - Initial Professional Development (IPD) objective
- Continuing Professional Development (CPD)
  - 25 hours per year (2 years before application)
- Working Experience Reference - 5 years

HKIE

- Report, Interview and Essay
- Report submission
  - 2000 words
  - CV + brief description of your involvement in specific projects

- All process in HK
- Interview arranged by yourself

- E.g. 3m report approval → 6m arrange interview → 4m waiting result (13m total)

IFireE CEng

- Report, Interview
- Report submission
  - 3000-6000 words
  - CV + Essay of specific projects meeting objectives

- HK → UK → HK → UK
- Interview arranged by assessor

- E.g. 6m report approval → 2m arrange interview → 5m waiting result (13m total)

HKIE

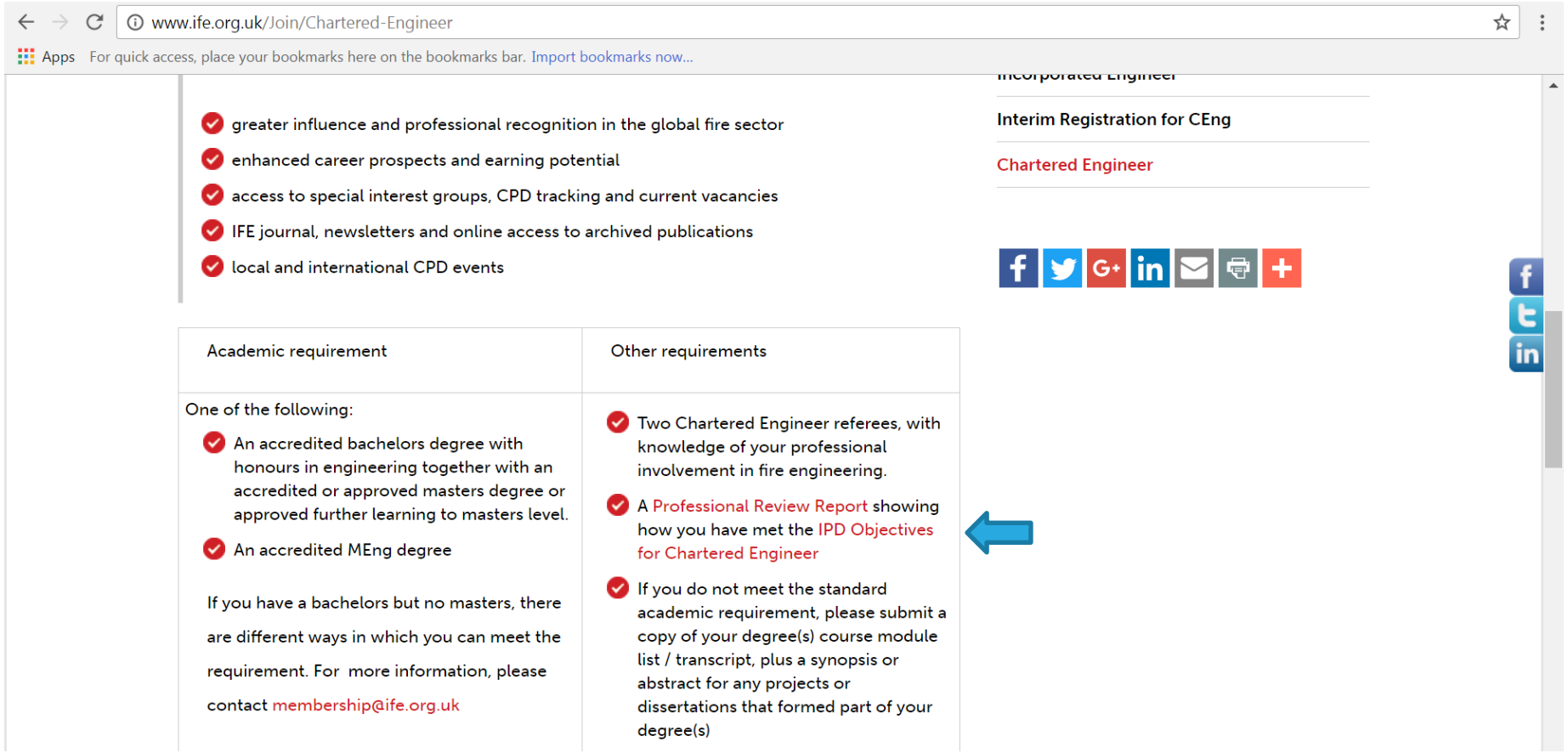
- Report on Training and Experience
  - 1600-2000 words
  - Summary of training & experience
  - Give details on any special issues encountered in your career and training
  - Indication of size/cost of works
- Drawings and Documents
  - Examples of recent work
- HKIE Logbook for candidates under Formal Training Route
- CPD Record

IFireE CEng

- Professional Review Report
  - 3000-6000 words
  - Career episodes cross-referenced to IPD objectives
  - Give details on any special issues encountered in your career and training
- CPD Record

IFireE CEng

- NOTE: Objectives for IFE and CEng are different
- http://www.ife.org.uk/Join/Chartered-Engineer



IFireE CEng– IPD Objectives

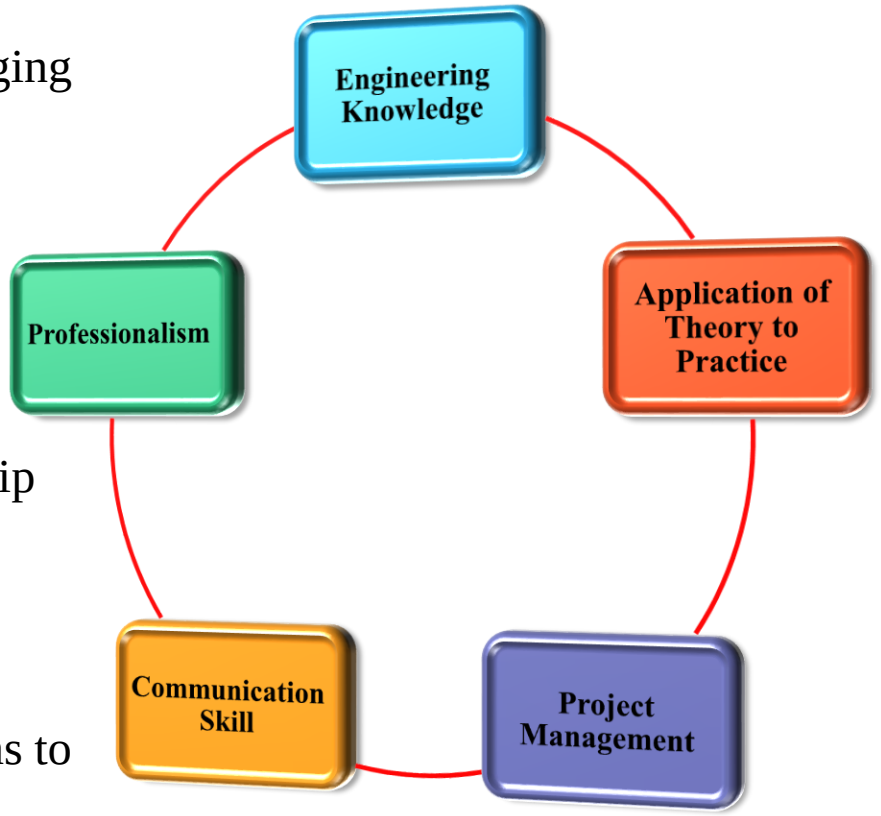
A. Use a combination of general and specialist fire engineering knowledge and understanding to optimise the application of existing and emerging technology

B. Apply appropriate theoretical and practical methods to the analysis and solution of fire engineering problems

C. Provide technical and commercial leadership

D. Demonstrate effective interpersonal skills

E. Demonstrate a personal commitment to professional standards, recognising obligations to society, the profession and the environment



IFireE – IPD Objectives

A1 – Sound theoretical approach
A2 – Creative and innovative development of technology

B1 – Identify potential projects and opportunities
B2 – Research, design and development
B3 – Implement solutions and evaluate effectiveness

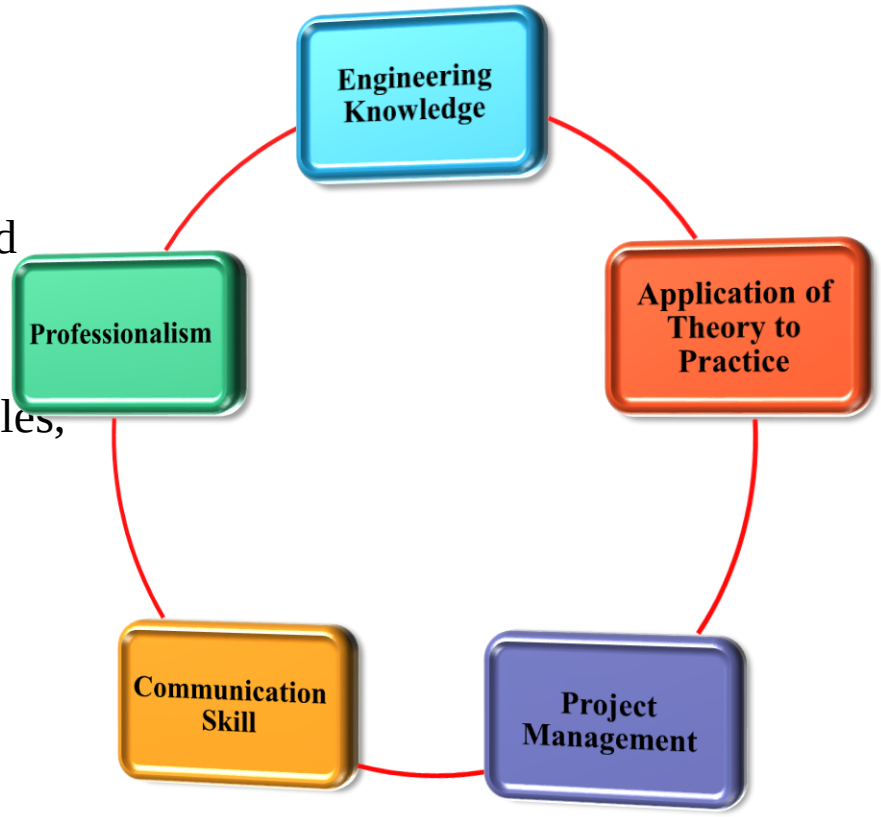
C1 – Plan for effective project implementation
C2 – Budget, organize, direct and control
C3 – Lead teams and develop staff to meet changing
C4 – Continuous improvement

D1 – Communicate with others at all levels
D2 – Presentation and discussion
D3 – Personal and social skills

E1 – Code and rule of conduct
E2 – Safe system of work
E3 – Sustainable environment
E4 – Continuing professional development
E5 – Application of ethical principles

IFireE CEng

- Not just what you did but
  - Why ?
  - How ? (describe process)
  - Thinking process
  - Demonstrate you were personally involved
  - Examples
- Demonstrate application of engineering principles, not simply follow prescriptive codes
- Not necessary a lot of pages, but good quality write up
- Cover **all** IPD objectives



Thank You

young.wong@arup.com