

# Pearson BTEC Level 5 Higher National Diploma in Construction and the Built Environment (Building Services Engineering - Electrical)



Registration Number / Course Code: 252615 / 014N

## 英國國家高級文憑 (屋宇裝備工程-電機工程)

It is a matter of discretion for individual employers to recognize any qualifications to which this course may lead to 個別僱主可酌情決定是否承認本課程可令學員獲取的任何資格

### Pearson BTEC 簡介

英國愛德思 (Pearson) 國家職業學歷與學術考試機構，是英國規模最大的學歷與職業資格頒證機構之一。Pearson 由英國主要職業資格考試機構「商業與技術教育委員會 “BTEC” 」和倫敦大學考試與評估委員會 (ULEAS) 合併而成。Pearson 的所有課程都由英國教育與技能部 “DfEs” 和英國教學大綱與學歷管理委員會 “QCA” 共同監管。Pearson 跟政府機構、學術機構及企業緊密合作，Pearson BTEC HND 在全球獲 120 個國家的大學認可。

### 課程簡介

- ◆ 電機工程課程內容由英國愛德思國家職業學歷與學術考試機構(BTEC)提供，是結合本港實際工程界的需要，並由香港設施工程學院(HKCE)主辦。
- ◆ 此課程給予學員廣泛而全面的知識，為學生建立良好的學術基礎，學員可自行報讀英國或海外大學的學位課程。
- ◆ 以學生為主的互動式教學，讓學生通過完成與職業相關的課程，學以致用，注重應用操作、團隊合作、案例分析、實踐創新。除專業及關鍵技能外，重視職業的通用技能培訓。
- ◆ 摒棄傳統考試的學習評估模式，每學科以習作成績作為評核標準，令學員能輕鬆學習

### 課程首席講師



**Dr Irwin P Kwan**

BSc(Engg), DBA, CEng, Eurlng,

CDCFOM, FCIBSE, FHKIFE, FIDCE

RPE (BS, ME, FE, BE) & REA, MHKIE

關博士是香港設施工程學院的榮譽校長，並一直致力於教育及培訓學員。由 1992 他一直希望透過創立本學院，以培植年青工程師達致機械、電機、建築及土木等各方面的設施工程專業水準。

### 證書頒發

- ◆ 學員需在指定時間內成功完成指定 16 科，所有功課經 BTEC 審核合格，並已通過校內英文考試合格 (英文資格如有 IELTS 5.5 或 CEFR 或 PTE 51 或相同資格; 或本校的校內英文試(由本校與 Wall Street English 合辦)), 將獲得由英國愛德思國家職業學歷與學術考試機構(BTEC)頒發國際認可英國國家高級文憑 (Higher National Diploma)。

## 課程認受性

- ◆ 成功取得 BTEC HND 之學員，可自行向香港學術及職業資歷評審局（評審局），取得本港認可的資格。
- ◆ Pearson BTEC HND 在全球獲 120 個國家的大學認可，本學院介紹或自行報讀海外大學。
- ◆ 成功取得 BTEC HND 之學員，可申請英國一些相關學會，成為副會員（須符合相關要求）
- ◆ 成功取得 BTEC HND 之學員，如需申請機電工程署 B 牌，需要另外修讀獨立課程 N5E31(Electrical Systems and Fault Finding)方可合乎機電工程署之要求。

## 申請註冊電工 B 牌要求

- 持有由香港專業教育學院頒發的電機工程學文憑，或具有相等資格，並受僱為電業工程人員最少已 5 年，其中最少 2 年包括電力工作實際經驗。(資料來源: 機電工程署網頁 [https://www.emsd.gov.hk/tc/electricity\\_safety/how\\_to\\_apply/registering\\_as\\_an\\_electrical\\_worker\\_for\\_electrical/index.html](https://www.emsd.gov.hk/tc/electricity_safety/how_to_apply/registering_as_an_electrical_worker_for_electrical/index.html))
- 需要申請電工 B 牌的同學，需要另外修讀獨立課程 N5E31 方可合乎機電工程署之要求。

## 入學條件

標準入學條件	非標準入學條件(需年滿 21 歲)
<ul style="list-style-type: none"><li>◆ 中七畢業 (F.7); 或</li><li>◆ 中學文憑試畢業 (DSE); 或</li><li>◆ 持有基礎文憑 (OD/PD); 或</li><li>◆ 持有英國國家高級證書/專業證書(HNC/HC);</li><li>◆ 英文要求<ol style="list-style-type: none"><li>1. IELTS 5.5 分或以上 or</li><li>2. HKDSE Level 3 or</li><li>3. HKCEE Level D or</li><li>4. A Level Grade E or</li></ol>如不能符合以上英文要求，需要在申請畢業前完成本校舉辦的英文班並通過考試。</li></ul>	<ul style="list-style-type: none"><li>◆ 中五畢業並有最少 5 年有關工作經驗及面試; 或</li><li>◆ 毅進課程畢業並有最少 3 年有關工作經驗及面試; 或</li><li>◆ 有關 10 年工作經驗及面試</li><li>◆ 英文要求<ol style="list-style-type: none"><li>1. IELTS 5.5 分或以上 or</li><li>2. HKDSE Level 3 or</li><li>3. HKCEE Level D or</li><li>4. A Level Grade E or</li></ol>如不能符合以上英文要求，需要在申請畢業前完成本校舉辦的英文班並通過考試。</li></ul>

## 學費 (全期學費分 4-8 期繳交，每期可選擇修讀 1-5 個單元)

基本學費	每單元 HK\$4800
優惠學費:	每單元 HK\$3200
9-10 月早鳥優惠	
現金/EPS 支付:	每單元 HK\$2,800
支票(以期票方式繳付):	每單元 HK\$2,700
早鳥繳費優惠:	每單元 HK\$2,700
(在 1,4,7,10 月繳交之後月分學費)	

## 其他費用

- ◆ 報名費 : HK\$500 (6-7 月成功報名，可獲卻免報名費)
- ◆ 筆記影印費 : 每科 HK\$300 (學生可自由選擇)
- ◆ BTEC 註冊費 : 三年註冊費 HK\$3,800
- ◆ 英語備試班及考試 : HK\$2,800
- ◆ 因個人原因需要將期票延期或退票，要收取行政費 HK\$300

## **申請豁免條款 (一經報名, 恕不接受任何豁免申請)**

- ◆ 申請獲豁免科目必須與 BTEC 課程內容相吻合, 為確保豁免科目符合 BTEC 要求, 學員需跟從指示提供相關的學術文件、成績、申請豁免科目的 Assignment, 以供本學院審核並由 BTEC 最終審核。審核費每科 HK\$1,000 (成功與否均不設退還)。

## **授課詳情**

- ◆ 授課語言 : 以英語及粵語教授, 輔以英文講義
- ◆ 課程師資 : 講師為註冊工程師(HKIS、RICS、CEng and RPE);或註冊設施經理或擁有碩士學歷及教育經驗; 或持有大學學位及相關工作經驗。
- ◆ 單元 : 16 單元 及 1 增潤單元(申請電工 B 牌必須修讀)
- ◆ 筆記 : 僅提供電子筆記
- ◆ 授課時間 : 7:00pm - 10:00pm
- ◆ 開課日期 : 每年的 3 月、6 月、9 月、12 月
- ◆ 截止報名 : 課程開課前兩星期 (詳情請向職員查詢)

## **課程內容 Course Content (基本內容)**

### **N5E01 – Individual Project**

Formulate a project that will provide a solution to an identified problem. Manage a project within agreed timescales and specification; documenting the process throughout. Evaluate potential project management solutions. Produce a project report and deliver a presentation of the final project outcomes.

### **N5E02 Construction Technology**

Explain the terminology used in construction technology. Describe the different techniques used to construct a range of substructures and superstructures, including their function and design selection criteria. Identify the different types of civil engineering/infrastructure technology used in support of buildings. Illustrate the supply and distribution of a range of building services and how they are accommodated within the building.

### **N5E03 Science & Materials**

Review health and safety regulations and legislation associated with the storage, handling and use of materials on a construction site. Discuss the environmental and sustainability factors which can impact on and influence the material choices for a construction project. Present material choices for a given building using performance properties, experimental data, sustainability and environmental consideration. 4. Evaluate the performance of a given building in respect of its human comfort requirements.

### **N5E04 Construction Practices & Management**

Describe the construction industry with reference to company structures and other activities. Explain different types of construction companies in the market and their relationships within the tendering process. Discuss the key stages in a construction project, and how Building Information Modelling informs the different stages. Analyse how the construction industry has developed suitable collaboration strategies in support of greater recognition of health & safety.

### **N5E08 Mathematics for Construction**

Use analytical and computational methods to solve construction related problems. Investigate applications of statistical techniques to interpret, organise and present data by using appropriate computer software packages. Illustrate the wide-ranging uses of calculus within different construction disciplines by solving problems of differential and integral calculus. Use mathematical methods to solve vector analysis, arithmetic progression and dimensional analysis examples.

### **N5E09 Principles of Heating Services Design & Installation**

Identify pre-design information required for a non-domestic heating system. Analyse heating loads for non-domestic buildings. Design a non-domestic heating system for a given building type. Justify the selection of non-domestic heating system components and installation strategy.

### **N5E10 Principles of Ventilation & Air-Conditioning Design & Installation**

Identify pre-design information required for a non-domestic ventilation and air conditioning system. 2. Analyse cooling load for non-domestic buildings. Present a design for a non-domestic ventilation and air conditioning system for a given building type. Justify the selection of non-domestic ventilation and air conditioning components and an installation strategy.

### **N5E19 Principles of Electrical Design & Installation**

Discuss the fundamentals of electricity, magnetism, transformers and circuits. Analyse the performance, operation and control of AC and DC motors. Explain the different methods of electricity distribution. Prepare a proposal for a non-domestic lighting installation.

### **N5E21 Electrical Machines**

Assess the constructional features and applications of transformers. Analyse the starting methods and applications of three-phase induction motors and synchronous machines. Investigate the types of generator available in industry by assessing their practical applications. Analyse the operating characteristics of electromagnetic transducers and actuators.

### **N5E22 Group Project**

Assess individual and group skills in order to allocate roles within a collaborative team. Plan a construction project, based on the Pearson-set theme, in collaboration with others to ensure good practice in resource management, staffing and project scheduling. Prepare tender documentation; undertaking work appropriate to a defined role within a team. Evaluate own work, and the work of others, in a collaborative team.

### **N5E28 Further Mathematics for Construction**

Apply instances of number theory in practical construction situations. Solve systems of linear equations relevant to construction applications using matrix methods. Approximate solutions of contextualized examples with graphical and numerical methods. Review models of construction systems using ordinary differential equations.

### **N5E32 Building Management Systems**

Evaluate emerging Building Management System technologies. Assess how a Building Management System can optimise cost and energy usage. Discuss the differences between Building Management Systems for domestic and non-domestic buildings. Specify a Building Management System suitable for a large domestic installation.

### **N5E33 Advanced Electrical Design and Installation**

Evaluate the principles that underpin the design and installation of power and distribution systems, electromagnetic compatibility equipment and electrical equipment. Discuss the range of protective measures necessary for the safe installation and operation of electrical systems. Design an electrical distribution plan for a complex non-domestic building. Present a report on the national/regional/local standards for technical, and health & safety regulations that apply to specific building types.

### **N5E39 Transport Systems in Buildings**

Discuss the functional requirements for circulation within a proposed building design. Determine traffic planning and equipment selection criteria. Discuss the installation of escalators and moving walkways into a building. Evaluate the installation of lift systems.

### **N5E40 Alternative Energy Systems Design & Installation**

Calculate a load duration curve from given data relating to a supply situation. Evaluate the principles that underpin the design and installation of alternative methods of power generation and distribution.

Discuss the social, political, environmental, and economic factors related to alternative energy systems. Report on the selection of an alternative energy scheme for a given context.

### **N5E53 Utilisation of Electrical Power**

Examine the demands, sources and construction of electrical power generation and distribution system. Explore the interconnections of power systems and their protection to explain the critical processes and the effects of failure and the importance of electrical safety. Evaluate the effectiveness of forms of engineering activity to promote sustainable development, with consideration of the economics of components, power systems and alternative energy sources.

Discuss new and emerging methods to optimise energy usage, conversion and storage techniques.

## **課程內容 Course Content ( B 牌要求之獨立課程 )**

### **N5E31 Electrical Systems and Fault Finding**

Electrical systems can be found in a very wide range of locations such as in manufacturing facilities, airports, transport systems, shopping centres, hotels and hospitals; people will come across them every day in their work place and at home. The system must take the electrical supply from the national grid, convert it to a suitable voltage and then distribute it safely to the various system components and uses such as electric motors, lighting circuits and environmental controls.

## 報名時需提供:

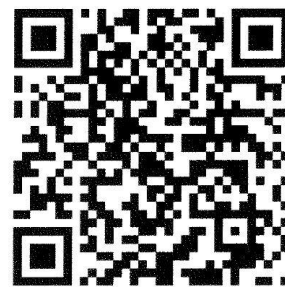
- 已填妥的報名表, 報名費 500 元, 及首期學費, 及期票
- 身份證
- 履歷表
- 畢業證書
- 工作經驗證明

## 報名及付款方法

- ★ 報名時請備EPS, 現金或劃線支票(信用咭暫不接受)
- ★ 如以劃線支票, 請在支票上註明收款人  
**TD Professional Education Group LTD.”**  
If pay by crossed cheque, please specify the payee to be  
**TD Professional Education Group LTD.”**  
郵寄地址:香港設施工程學院, 九龍旺角廣東道982號, 嘉富商業中心15樓
- ★ 轉數: 將學費直接存入銀行戶口, 連同銀行收據及填妥之報名表格WhatsApp至: 65286900。  
尖端教育集團有限公司: 東亞銀行 514-40-55818-4  
尖端教育集團有限公司: 滙豐銀行 124-422288-001  
轉數快認識碼: 102669215  
Or deposit the payment to our Bank A/C:  
TD Professional Education Group Ltd: East Asia Bank A/C: 514-40-55818-4  
TD Professional Education Group Ltd: HSBC: 124-422288-001  
and WhatsApp us the bank receipt accompany your application form at 65286900.  
**FPS Code: 102669215**

and whatsapp us the bank receipt accompany your application form at 65286900.

- ★ 或連同報名表格及學費親臨本學院繳交。  
(Or submit the application form with the course fee in person
  - ★ 或支付寶:
    - 首先開啟支付寶『掃一掃』
    - 再掃描二維碼及輸入金額
    - 交易完成
- 6. 如申請退學, 學生需於本課程開始前最少5個工作日以書面通知退學  
否則已繳學費概不退還。申請者申請退還學費需繳交手續費HK\$300。
- 7. 延遲交付學費的學生必須遵守本學院的規定, 按照申請書上的延遲日期  
為期限, 到期不交學費, 本院收取附加費用 HK\$300。



## 注意事項

1. 香港設施工程學院已實施個人資料 (私隱) 政策, 有關資料單張可於報名處索閱, 或閣下可與本學院個人資料管理主任查詢。
2. 香港設施工程學院保留在任何情況下及以任何原因拒絕任何入學申請的權利。申請者繳付學費後, 仍須符合入學的所有條件, 其申請方可獲得接納。
3. 香港設施工程學院保留在任何情況下更改課程內容、授課地點、日期及時間的權利。
4. 如申請退學, 學生需於本課程開始前最少5個工作日以書面通知退學, 否則已繳學費概不退還。申請者申請退還學費需繳交手續費HK\$300。

查詢熱線 : 3165 8069  
電郵地址 : [enquiry@tdpedu.org](mailto:enquiry@tdpedu.org);

WhatsApp : 65286900  
學院網址 : <http://www.tdpedu.org>