

Pearson BTEC Level 5 HND in Construction and the Built Environment (Building Services Engineering) (QCF)屋宇裝備工程高級文憑 (Reg. No.: 252435)

1. Design Principles and Application for Construction and the Built Environment

This module enables learners to develop their ability to evaluate the planning and design phases and consider the environmental impact of construction projects. Learners will explore the roles and legal responsibilities of all parties involved in construction projects.

2. Applied Mathematics for Construction and the Built Environment

This module provides learner with an understanding of analytical techniques and the mathematical skills needed to solve construction and engineering problems. This module has been designed to enable learners to use mathematical processes to solve construction, civil engineering and building services engineering problems.

3. Management Principles and Application for Construction and the Built Environment

This module introduces learners to the principles and application of management as they relate to the technical and professional disciplines of construction, civil engineering and building services engineering. Learners will gain an understanding of how these principles may be applied to the management of construction, building services engineering or civil engineering activities through the application of recognized management techniques.

4. Group Project in the Construction Industry

This module will develop learner's skills in terms of the evaluation and resolution of realistic practical problems and the ability to work as part of a team. This module also enables the application of knowledge, understanding and skills developed in other modules, and where possible experiences from work, to a major piece of work.

5. Health, Safety and Welfare for Construction and the Built Environment

On completion of this module, learners will understand current health, safety and welfare legislation applicable to the construction and built environment sector. Learners will understand how to identify and record hazards, assess risks and

select appropriate control measures to prevent or mitigate ill health and injuries on site.

6. Applied Mathematics for Complex Engineering Problems

This module will enhance learners' capabilities in respect of trigonometry, algebra, calculus and statistics. Trigonometric functions are explored largely as a foundation for their application to the understanding of waves. Additional techniques, including matrices and numerical methods, are introduced so learners are able to solve linear and non-linear algebraic equations. This module will enhance learners' capabilities in respect of trigonometry, algebra, calculus and statistics. Trigonometric functions are explored largely as a foundation for their application to the understanding of waves. Additional techniques, including matrices and numerical methods, are introduced so learners are able to solve linear and non-linear algebraic equations.

7. Air Conditioning for Industrial and Commercial Buildings

This module will develop learner skills in applying the principles of design and operation of air conditioning equipment and installations. Learners will have an opportunity to experience the process of completing air conditioning designs in complex industrial and commercial applications. This module will also enable learners to interpret the air conditioning requirements of buildings, develop practical air conditioning schemes for a range of environments, and evaluate the effectiveness of alternative schemes.

8. Electricity and Lighting for Building Services Engineering

This module develops the skills needed to design simple electrical and lighting installations in compliance with relevant legislation and standards. Learners will explore general and emergency lighting installations, the distribution of electrical power, the legislation that underpins the design of electrical installations, the specification of fire protection systems, and the use of motors and control installations in mechanical plant.

9. Air Conditioning for Complex Industrial and Commercial Buildings

In this module learners will develop skills in applying the principles of air conditioning and will complete air conditioning designs for large, complex, multi-zone buildings. This module enables learners to interpret the air conditioning and ventilation requirements of buildings, develop practical air conditioning schemes

for a range of environments and evaluate the effectiveness of alternative schemes.

10. Electrical protection and Transportation installations for Non-domestic Buildings

This unit focuses on the principles that underpin the design and specification of electrical protection and transportation installations for non-domestic buildings. Learners will investigate the selection and specification of overcurrent protection devices and explore the design and specification of lightning protection, standby power supplies, fire/smoke detection and alarm systems, and transportation installations. Learners will apply the associated legislation, standards and design guides for electricity, fire and public safety. Learners will also have the opportunity to establish strategies, produce design drawings and perform the calculations needed to size, select and specify the various items of plant and equipment required for electrical protection and transportation installations.

11. Electrical Installation for Building Services Engineering

This module will develop learner understanding of the underlying principles in the design and commissioning of low voltage electrical distribution systems and the application of current standards and legislation. This module also provides an opportunity for learners to experience the process of completing electrical designs for complex non-domestic applications.

12. Power Supplies for Building Services Engineering

This module provides learners with the understanding and skills needed to apply the principles and practices of HV supplies to complex industrial and commercial buildings. Learners will investigate how circuit theorems and complex quantities are used to analyse AC power supply networks. Learners will explore the principles underpinning the use of transformers and the various applications of transformers. This module also considers the issues associated with fault currents, HV distribution systems and abnormal loads and learners will develop the skills needed to quantify each of the above in terms of providing safe and effective HV power supplies.

13. Building Management Systems for Building Services Engineering

This module allows learners to explore the characteristics of BMS installations and consider how these systems can be used to manage and control the mechanical and electrical services of buildings and promote internal environmental comfort and energy efficiency. Learners will investigate the use of BMS hardware to

achieve the aims of BMS strategies and examine the associated installation and operational issues.

14. Project Management for Building Services Engineering

This module is designed to develop learner skills in applying the techniques and procedures of building services engineering project management. Learners will understand how to establish clear project objectives and explore the management skills and processes required to achieve those objectives. Learners will study the implications of the different methods of procurement and produce tenders and estimates for building services installations.

15. Application of Scientific Principles to Building Services Engineering

This module will develop learners' understanding of the scientific principles and concepts used in a wide range of building services engineering applications and it provides a basis for studying the more specialised building service applications. Learners will explore the fundamental principles of heat transfer, fluid flow, acoustics, electrical networks and controls systems.

16. Research Project

This module is designed to enable learners to gain confidence in using research techniques and methods. It addresses the elements that make up formal research including the proposal, a variety of research methodologies, action planning, carrying out the research and presenting the findings. To complete this module satisfactorily, learners must understand the theory that underpins formal research. The research itself will depend on learners, the context of their area of learning, their focus of interest and the anticipated outcomes.