

Pearson BTEC International Level 3 Qualifications in Building Services Engineering

Delivery Guide Introduction

Pearson BTEC Level 3 International Qualifications in Building Services Engineering

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Pearson BTEC International Level 3 Diploma in Building Services Engineering (720 GLH)

Pearson BTEC International Level 3 Extended Diploma in Building Services Engineering
(1080 GLH)

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Welcome to your BTEC International delivery guide

With a track record built over 40 years of learner success, Pearson BTEC qualifications are recognised internationally by governments, industry and higher education. BTEC International Level 3 qualifications allow learners to progress to the workplace – either directly or via study at a higher level. More than 100,000 BTEC learners apply to university every year. Their Level 3 BTECs, either on their own or in combination with International A Levels, are accepted by UK and international universities, and higher education institutions for entry to relevant degree programmes.

This delivery guide is a companion to your BTEC Level 3 International specifications, Authorised Assignment Briefs (AABs) and Sample Pearson Set Assignments. It contains ideas for teaching and learning, including practical activities, realistic scenarios, ways of involving employers in delivery, ways of managing independent learning and how to approach assessments. The aim of this guide is to show how the specification content might work in practice and to inspire you to start thinking about different ways to deliver your course.

The guidance has been put together by tutors who have been close to the development of the qualifications and so understand the challenges of finding new and engaging ways to deliver a BTEC programme in the context of the qualifications from 2020.

Guidance around what you will need to consider as you plan the delivery of the qualification(s) has been given. You will find information around the structure of your course, how you may wish to build the course for your learners, suggestions for how you could make contact with employers and information around the other support and resources available to you.

Unit-by-unit guidance is given in the unit specifications. This guide includes suggestions on how to approach the learning aims and unit content, as well as ideas for interesting and varied activities. You will also find coverage of assessments, including useful advice about Pearson set assessments, as well as tips and ideas around how to plan for and deliver your assignments.

Additionally, you will find a list of carefully selected resources for each unit in the unit specifications. The lists include suggestions for books, websites and videos that you can either direct your learners to use or that you can use as a way to complement your delivery.

We hope you will find this guidance relevant and useful.

Enjoy your course!



What's new

Pearson has developed the content of the new BTEC International Level 3 qualifications in collaboration with employers and representatives from higher education, and relevant professional bodies. In this way, we have ensured that content is up to date and that it includes the knowledge, understanding, skills and personal attributes required in the sector. The mandatory content ensures that all learners are following a coherent programme of study and that they acquire knowledge, understanding and skills that will be recognised and valued by higher education and employers. As a result of this consultation, and on the advice of employers, higher education institutions and – most importantly – of those of you who teach BTEC, some key changes have been made to the BTEC Level 3 units, which form the basis of this set of qualifications. These are described through this delivery guide and include the following.

- **New content and revisions to the proportion of mandatory content** – both employers and universities said they wanted a greater consistency in coverage of the subject for BTEC learners. Employers wanted to see systematic coverage of core knowledge and skills for their sector, and to reflect up-to-date industry practice.
- **A focus on employability skills** – the BTEC approach to learning, through projects, self-directed assignments, group work and work placements, has always supported the development of employability skills, e.g. self-management. In this new suite of qualifications, the balance of cognitive and skills work has been carefully calibrated to ensure that learners get a range of different opportunities across their course. The qualifications are mapped to transferable skills, and these are supported in Pearson ebooks.
- **Broader assessment in internal units** – the assessment criteria for each unit are carefully structured to set a clear level of demand. Distinction criteria encourage and require depth of study, including demonstration of the application of knowledge and understanding as well as a synoptic element for the learning aim or unit.

We are providing an enhanced support programme with exemplar and practice materials and training. Please see the *Support and resources* section of the specification for details of this support, which continues throughout the lifetime of the qualification.

Notes:

The specification tells you what **must** be taught and what **must** be assessed. This delivery guide gives suggestions about **how** the content could be delivered.

The suggestions given in this delivery guide link with the Authorised Assignment briefs provided by Pearson, but **they are not compulsory**. They are **designed to get you started and to help spark your imagination**.



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Overview

Delivery Guides as support

In the specification, the 'Unit content' tells you what must be taught and the 'Assessment criteria' tell you what must be assessed. The 'Essential information for assessment decisions' explains what the assessment criteria mean.

The delivery guides give suggestions and ideas on how to plan and deliver the qualification. You will also find complementary delivery plans made available to help you timetable your course and ensure your learners are well prepared for internal assessments.

Unit delivery guides give suggestions on how to approach the learning aims and unit content. Teaching, learning and formative assessment activities are also suggested. Links to carefully selected resources are given for each unit. The lists include suggestions for books, websites and videos, which will help you to plan and deliver your course. Alternatively, you may wish to direct your learners to these resources. Use the delivery guides as model templates or an interpretation on which you can base your own plan. Every delivery guide presents each unit as an exemplar, highlighting Building Services Engineering links to motivate tutors and learners.



Structure and purpose

Title	Size and structure		Summary purpose
Pearson BTEC International Diploma in Building Services Engineering	Equivalent in size to two International A Levels There are six mandatory units, of which four are assessed by Pearson Set Assignment; mandatory content (50%) External set assignment (33.3%) Learners will complete remaining optional units to the value of 360 GLH	720 GLH	This qualification is designed to support learners who want to study Building Services Engineering as the main element alongside another area of complementary or contrasting study as part of a two-year, full-time study programme. The qualification would support progression to higher education if taken as part of a programme of study that included other BTEC Nationals or International A Levels.
Pearson BTEC International Extended Diploma in Building Services Engineering	Equivalent in size to three International A Levels There are six mandatory units, of which four are assessed by Pearson Set Assignment; mandatory content (33.3%) External set assignment (22.2%) Learners will complete remaining optional units to the value of 720 GLH	1080 GLH	This qualification is designed as a full-time course to support learners who want to study Building Services Engineering as the main focus of a two-year, full-time study programme. The qualification would support progression to higher education in its own right.







Structure

The tables below show the structure of the qualifications in the Construction suite of qualifications. By a clear understanding of the units and careful selection, centres can tailor the qualification to suit the needs of their learners and the resources of the centre. Ensure that you use the full structure found in *Section 2* of the specification when planning your course. It is important that you select the units carefully to meet all the rules of combination for the targeted qualification.

Structures of the qualifications at a glance

This table shows all the units and qualifications to which they contribute. The full structure for this Pearson BTEC International Level 3 in Construction is shown in *Section 2 Structure*. **You must refer to the full structure to select units and plan your programme.**

Key

	Pearson Set Assignment		Mandatory units		Optional units
	Construction and the Built Environment		Civil Engineering		Building Services Engineering

Unit (number and title)	Unit size (GLH)	Certificate (180 GLH)	Subsidiary Diploma (360 GLH)	Foundation Diploma (540 GLH)	Diploma (720 GLH)			Extended Diploma (1080 GLH)		
		CBE	CBE	CBE	CBE	CE	BS	CBE	CE	BSE
1 Construction Technology	60	M	M	M	M	M	M	M	M	M
2 Construction Design	60	M	M	M	M	M	M	M	M	M
3 Construction Science	60	M	M	M	M	M	M	M	M	M
4 Safe Working Practice	60				M	M	M	M	M	M
5 Management of Commercial Risk	60				M			M		
6 Construction Mathematics	60				M	M	M	M	M	M
7 Graphical Detailing	60		O	O	O	O	O	O	O	O
8 Sustainability in Construction	60		O	O	M			M		
9 Building Information Modelling and Artificial Intelligence	60		O	O	O	O	O	O	O	O

10 Surveying in Construction	60		O	O		M			M	
11 Management of a Construction Project	60		O	O	O	O	O	O	O	O
12 Building Surveying in Construction	60		O	O			M			M
13 Site Engineering for Construction	60		O	O	O	O		O	O	
14 Low Temperature Hot Water Systems in Building Services	60		O	O	O	O	O	O	O	O

Unit (number and title)	Unit size (GLH)	Certificate (180 GLH)	Subsidiary Diploma (360 GLH)	Foundation Diploma (540 GLH)	Diploma (720 GLH)			Extended Diploma (1080 GLH)		
		CBE	CBE	CBE	CBE	CE	BS	CBE	CE	BSE
15 Measurement Techniques in Construction	60		0	0	0	0	0	0	0	0
16 Provision of Primary Services in Buildings	60		0	0	0		0	0		0
17 Further Mathematics for Construction	60				0	0	0	0	0	0
18 Work Experience	60		0	0	0	0	0	0	0	0
19 Projects in Construction	60		0	0	0			0		
20 Quantity Surveying	60		0	0	0		0	0		0
21 Building Services Science	60						0			0
22 Economics and Finance in Construction	60		0	0	0	0		0	0	
23 Construction in Civil Engineering	60				0	0		0	0	
24 Conversion, Adaptation and Maintenance of Buildings	60				0			0		
25 Building Services Control Systems	60						0			0
26 Heating Ventilation and Air Conditioning Design	60						0			0
27 Plumbing and Fluid Behaviour in Building Services Engineering	60						0			0
28 Electrical Principles and Installation Standards in Building Services Engineering	60						0			0
29 Principles and Applications of Structural Mechanics	60					0			0	
30 Public Health Engineering	60				0	0		0	0	

Unit (number and title)	Unit size (GLH)	Certificate (180 GLH)	Subsidiary Diploma (360 GLH)	Foundation Diploma (540 GLH)	Diploma (720 GLH)			Extended Diploma (1080 GLH)		
		CBE	CBE	CBE	CBE	CE	BS	CBE	CE	BSE
31 Specialist Civil Engineering Techniques	60					O			O	
32 Highway Construction and Maintenance in Civil Engineering	60					O			O	
33 Offsite and Onsite Construction Methods	60				O	O	O	O	O	O
34 Planning the Built Environment	60				O	O		O	O	



In order to maximise the quality of learning, the structure of the qualifications has been developed with significant input from all sectors that require learners to have underpinning skills in engineering, including a breadth of employers, higher education institutions and delivery centres.

Learners on the smaller size qualifications who find they have a continuing interest in engineering can move on to a larger qualification in the suite. This flexibility is facilitated through a considered number of mandatory and assessed units, which avoids unnecessary repetition of assessment of units.

The Diploma and Extended Diploma focus on enabling learners to move into industry, ensure that they can manage a client brief, realise intentions and have an awareness of professional practice through their understanding of mandatory taught and assessed content.

All qualifications require meaningful employer involvement that is relevant to the industry, sector or occupation. This employer involvement can include:

- work experience and placements
- projects set by employers
- co-delivery of units with employers
- industry guests that contribute to learner practice.

We firmly believe in the relevance of learning through employer engagement and the qualifications give ideas on how this can be achieved. Most of the units highlight where employer involvement would benefit the learning and make useful suggestions for how to initiate this participation.

Set assignment units

Some mandatory units in the qualifications are assessed using a Pearson set assignment. Each assessment is set by Pearson and may need to be taken under controlled conditions before it is marked by teachers.

Set assignment units are subject to external standards verification processes common to all BTEC units. By setting an assignment for some units, we can ensure all learners take the same assessment for a specific unit. Learners are permitted to resit set assignment units during their programme as detailed in *Section 6* of the specification.

Set assignments are available from September each year and are valid for one year only.



Overview of the Building Services Engineering qualification suite

As shown in the 'Overview', the Building Services Engineering suite of BTEC qualifications suite offers a combination of mandatory and optional units with internal and Pearson set assessments, which will drive the quality of learning. It will also help learners to take increased responsibility for their own development.

The demands within industry mean learners need to be able to manage deadlines and communicate their ideas in different ways. This assessment methodology closely matches experiences learners will have in employment and thus increases their chances of successful progression.

The units give valuable ways for learners to develop highly transferable skills and to be assessed in a synoptic way. All of the units can contain opportunities for stakeholder or employer engagement to stimulate learning experiences.

The combination of mandatory and optional unit content means the qualification in Building Services Engineering is designed to suit a broad mix of industry needs. These qualifications cover Building Services Engineering content on, for example, manufacturing processes or computer programming.

Diploma

This qualification is designed to be the substantive part of a 16–19 study programme for learners who want a strong core of Building Services Engineering study. This programme may include other qualifications to support progression either directly to employment in the construction sector or to higher education courses in engineering. Learners are able to focus on specialisms such as heating, ventilation and air conditioning or building services science. The additional qualification(s) studied allow learners to either give breadth to their study programme by choosing a contrasting subject, or to give it more focus by choosing a complementary subject. This qualification can also be used to progress to employment in this sector.

Extended Diploma

This qualification is designed to be the main focus of Building Services Engineering learning in a typical two-year, 16–19 study programme.

This size of the qualification is particularly appropriate for those with an interest in progressing directly to a career in a specialist area of Building Services Engineering or to enter the sector following a course in higher education. The same pathways are available as for the Diploma-sized qualification. Careful selection of the units makes the Extended Diploma the most flexible in terms of catering for a range of specialist pathways that can be efficiently delivered.



Making the right choice for your learners

The qualifications are meant to be inclusive and support individuals in their progression. The prior achievement and aspirations of learners is key to advising the most appropriate study programme.

For learners who wish to progress directly to higher education, the qualifications ensure they will have the skills to cope with the academic and independent learning required. In recognition of some of the highly specialised areas within the Building Services Engineering industry, the qualifications provide opportunities for learners to gain vocational experience in parallel with other specialist qualifications. These Diplomas support progression into industry at entry or apprenticeship levels with the understanding required to progress in their careers. The tables below gives examples of learners' potential progression routes.

16-year-old student choice		
Progression intention	Prior achievement	Potential BTEC International route
Building Services Engineering subject in HE	Five IGCSEs at grade 9–4, including Maths and English	BTEC Diploma in Building Services Engineering alongside A Levels in e.g. Maths, Physics.
Higher Apprenticeship in Building Services Engineering but uncertain of specialism	Five IGCSEs at grade 9–4, including Maths and English	Year 1: BTEC Foundation Diploma in Construction and Built Environment. Year 2: Start apprenticeship or continue into BTEC Diploma in a chosen specialism.
Higher Apprenticeship in Building Services Engineering	Five IGCSEs at grade 9–4, including Maths and English	BTEC Extended Diploma in Building Services Engineering.
Directly to employment in a Building Services Engineering environment	Five IGCSEs at grade 9–4, including Maths and English	BTEC Diploma in Building Services Engineering alongside other BTEC or qualifications in e.g. Product Design, Business, or standalone BTEC Extended Diploma in Building Services Engineering.



*Routes to higher education (HE) or employment are dependent on prior experience.

19+ learner choice*		
Progression	Prior achievement	Potential BTEC International route
Employment in Building Services Engineering	No experience in Building Services Engineering, but with five IGCSEs at grade 9–4, including Maths and English	BTEC Extended Diploma in Building Services Engineering

Making contact with employers

Employer contact is one of the most cherished experiences BTEC International learners can have, as it ensures realistic and valuable learning.

Partnerships between companies, freelance practitioners and centres can often develop a relationship that is beneficial to both parties. Here are some ideas that may support centres expanding their employer engagement.

Employability skills

Employers look not only for technical skills but also employability skills. These include:

- **self-management:** readiness to accept responsibility, flexibility, time management, readiness to improve own performance
- **team working:** respecting others, cooperating, negotiating/persuading, contributing to discussions
- **business and customer awareness:** basic understanding of the key drivers for business success and the need to give customer satisfaction
- **problem-solving:** ability to analyse facts and circumstances and apply creative thinking to develop appropriate solutions
- **communication and literacy:** application of literacy, ability to produce clear, structured written work, and oral literacy (including listening and questioning)
- **application of numeracy:** manipulation of numbers, general mathematical awareness and its application in practical contexts
- **application of information technology:** basic IT skills including familiarity with word-processing, spreadsheets, file management and use of internet search engines.



Support and resources

Support for setting up your course and preparing to teach

Specification

The specification (for teaching from April 2020) gives you details of the administration of the qualifications and information on the units for the qualifications.

Delivery Guide

This free guide gives you important advice on how to choose the right course for your learners and how to ensure you are fully prepared to deliver the course. It explains the key features of BTEC International Level 3 qualifications – for example, employer involvement and employability skills. It also covers guidance on assessment and quality assurance. The Guide tells you where you can find further support and gives detailed unit-by-unit delivery guidance. It includes teaching tips and ideas, assessment preparation and suggestions for further resources.

Schemes of work

Free sample schemes of work are given for each mandatory unit. These are available in Word™ format for ease of customisation.

myBTEC

myBTEC is an online toolkit that lets you plan and manage your BTEC provision from one place. It supports the delivery, assessment and quality assurance of BTECs in centres and supports teachers with the following activities:

- checking that a programme is using a valid combination of units
- creating and verifying assignment briefs (including access to a bank of authorised assignment briefs that can be customised)
- creating assessment plans and recording assessment decisions
- tracking the progress of every learner throughout their programme.

To find out more about myBTEC, visit the myBTEC page on the support services section of our website.

Support for teaching and learning

Pearson Learning Services provides a range of engaging resources to support BTEC International Level 3 qualifications. These may include:

- textbooks in ebook and print formats
- revision guides and revision workbooks in ebook and print formats



- teaching and assessment packs, including e-learning materials via the Active Learn Digital Service.

Teaching and learning resources are also available from a number of other publishers. Details of Pearson's own resources and of all endorsed resources can be found on our website.

Support for assessment

Sample assessment materials for internally-assessed units

For internal units assessed with a Pearson Set Assignment we will provide a sample assignment as an example of the form of assessment for the unit.

We provide a service in the form of Authorised Assignment Briefs and sample Pearson Set Assignments, which are approved by Pearson Standards Verifiers. These resources are available via our website and on myBTEC.

Pearson English

Pearson provides a full range of support for English learning, including diagnostics, qualifications and learning resources. Please see www.pearson.com/english

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