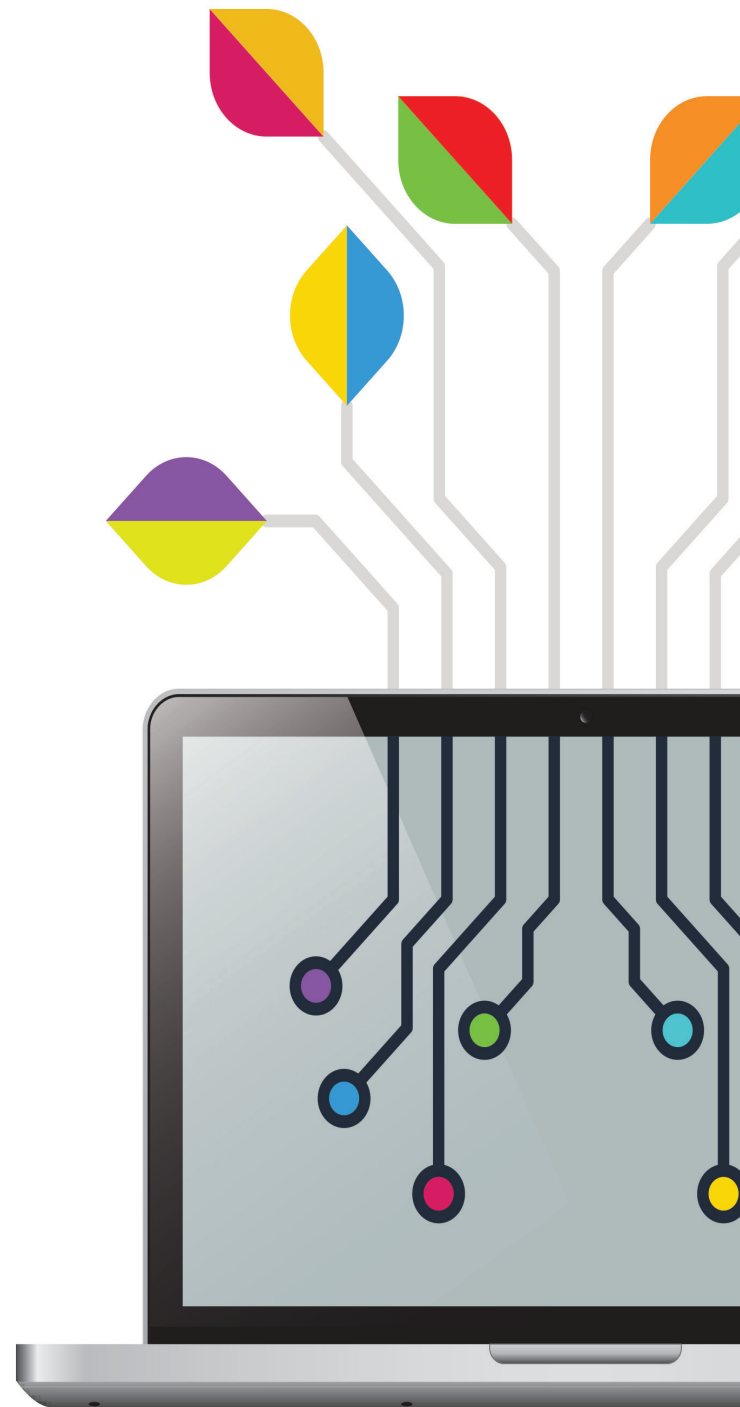


Pearson BTEC Level 3 National Certificate in Computing



Specification

First teaching from September 2017

First certification from 2018

Issue 5

Pearson BTEC Level 3 National Certificate in Computing Specification

First teaching September 2017

Issue 5

Edexcel, BTEC and LCCI qualifications

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This specification is Issue 5. We will inform centres of any changes to this issue. The latest issue can be found on our website.

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Welcome

With a track record built over 30 years of learner success, BTEC Nationals are widely recognised by industry and higher education as the signature vocational qualification at Level 3. They provide progression to the workplace either directly or via study at a higher level. Proof comes from YouGov research, which shows that 62% of large companies have recruited employees with BTEC qualifications. What's more, well over 100,000 BTEC students apply to UK universities every year and their BTEC Nationals are accepted by over 150 UK universities and higher education institutes for relevant degree programmes either on their own or in combination with A Levels.

Why are BTECs so successful?

BTECs embody a fundamentally learner-centred approach to the curriculum, with a flexible, unit-based structure and knowledge applied in project-based assessments. They focus on the holistic development of the practical, interpersonal and thinking skills required to be able to succeed in employment and higher education.

When creating the BTEC Nationals in this suite, we worked with many employers, higher education providers, colleges and schools to ensure that their needs are met. Employers are looking for recruits with a thorough grounding in the latest industry requirements and work-ready skills such as teamwork. Higher education needs students who have experience of research, extended writing and meeting deadlines.

We have addressed these requirements with:

- a range of BTEC sizes, each with a clear purpose, so there is something to suit each learner's choice of study programme and progression plans
- refreshed content that is closely aligned with employers' and higher education needs for a skilled future workforce
- assessments and projects chosen to help learners progress to the next stage. This means some are set by you to meet local needs, while others are set and marked by Pearson so that there is a core of skills and understanding that is common to all learners. For example, a written test can be used to check that learners are confident in using technical knowledge to carry out a certain job.

We are providing a wealth of support, both resources and people, to ensure that learners and their teachers have the best possible experience during their course. See *Section 10* for details of the support we offer.

A word to learners

Today's BTEC Nationals are demanding, as you would expect of the most respected applied learning qualification in the UK. You will have to choose and complete a range of units, be organised, take some assessments that we will set and mark, and keep a portfolio of your assignments. But you can feel proud to achieve a BTEC because, whatever your plans in life – whether you decide to study further, go on to work or an apprenticeship, or set up your own business – your BTEC National will be your passport to success in the next stage of your life.

Good luck, and we hope you enjoy your course.

Collaborative development

Students completing their BTEC Nationals in Computing will be aiming to go on to employment, often via the stepping stone of higher education. It was, therefore, essential that we developed these qualifications in close collaboration with experts from professional bodies, businesses and universities, and with the providers who will be delivering the qualifications. To ensure that the content meets providers' needs and provides high-quality preparation for progression, we engaged experts. We are very grateful to all the university and further education lecturers, teachers, employers, professional body representatives and other individuals who have generously shared their time and expertise to help us develop these new qualifications.

In addition, universities, professional bodies and businesses have provided letters of support confirming that these qualifications meet their entry requirements. These letters can be viewed on our website.

Summary of Pearson BTEC Level 3 National Certificate in Computing specification Issue 5 changes

Summary of changes made between the previous issue and this current issue	Page number
The last paragraph of the <i>Qualification and unit content</i> section has been amended to allow centres delivering the qualification above to alter the content to reflect the context of the country where it is being delivered.	Page 6
The qualifications below are being retired and reference removed from Introduction to BTEC National qualifications for the computing sector, <i>Qualifications, sizes and purposes at a glance</i> and the <i>Structures of the qualifications at a glance</i> : Pearson BTEC Level 3 National Diploma in Computer Science (720 GLH) 601/7338/5 Pearson BTEC Level 3 National Diploma in Computing for Creative Industries (720 GLH) 601/7340/3 Pearson BTEC Level 3 National Diploma in Computer Systems and Network Support (720 GLH) 601/7339/7 Pearson BTEC Level 3 National Diploma in Business Information Systems (720 GLH) 601/7337/3.	Pages 1, 4 and 5.

Summary of Pearson BTEC Level 3 National Extended Diploma in Computing specification Issue 4 changes

Summary of changes made between Issue 3 and Issue 4	Page number
The wording in Section 7 <i>Teacher/centre malpractice</i> has been updated to clarify suspension of certification in certain circumstances.	Page 266
The wording under Section 9 <i>Understanding the qualification grade</i> has been updated to clarify current practice in ensuring maintenance and consistency of qualification standards.	Page 269

If you need further information on these changes or what they mean, contact us via our website at: qualifications.pearson.com/en/support/contact-us.html.

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Introduction to BTEC National qualifications for the computing sector

This specification contains the information you need to deliver the Pearson BTEC Level 3 National Certificate in Computing. The specification signposts you to additional handbooks and policies. It includes all the units for this qualification.

This qualification is part of the suite of computing qualifications offered by Pearson. In the suite there are qualifications that focus on different progression routes, allowing learners to choose the one best suited to their aspirations.

All qualifications in the suite share some common units and assessments, allowing learners some flexibility in moving between sizes. The qualification titles are given below.

Some BTEC National qualifications provide a broad introduction that gives learners transferable knowledge and skills. These qualifications are for post-16 learners who want to continue their education through applied learning. The qualifications prepare learners for a range of higher education courses and job roles related to a particular sector. They provide progression either by meeting entry requirements in their own right or by being accepted alongside other qualifications at the same level and adding value to them.

In the computing sector these qualifications are:

Pearson BTEC Level 3 National Certificate in Computing (180 GLH) 603/0446/7

Pearson BTEC Level 3 National Extended Certificate in Computing (360 GLH) 601/7341/5

Pearson BTEC Level 3 National Foundation Diploma in Computing (510 GLH) 601/7343/9

Pearson BTEC Level 3 National Diploma in Computing (720 GLH) 603/0445/5

Pearson BTEC Level 3 National Extended Diploma in Computing (1080 GLH) 601/7342/7.

This specification signposts all the other essential documents and support that you need as a centre in order to deliver, assess and administer the qualification, including the staff development required. A summary of all essential documents is given in *Section 7*. Information on how we can support you with this qualification is given in *Section 10*.

The information in this specification is correct at the time of publication.

Total Qualification Time

For all regulated qualifications, Pearson specifies a total number of hours that it is estimated learners will require to complete and show achievement for the qualification: this is the Total Qualification Time (TQT). Within TQT, Pearson identifies the number of Guided Learning Hours (GLH) that we estimate a centre delivering the qualification might provide. Guided learning means activities, such as lessons, tutorials, online instruction, supervised study and giving feedback on performance, that directly involve teachers and assessors in teaching, supervising and invigilating learners. Guided learning includes the time required for learners to complete external assessment under examination or supervised conditions.

In addition to guided learning, other required learning directed by teachers or assessors will include private study, preparation for assessment and undertaking assessment when not under supervision, such as preparatory reading, revision and independent research.

BTEC Nationals have been designed around the number of hours of guided learning expected. Each unit in the qualification has a GLH value of 60, 90 or 120. There is then a total GLH value for the qualification.

Each qualification has a TQT value. This may vary within sectors and across the suite depending on the nature of the units in each qualification and the expected time for other required learning.

Qualifications, sizes and purposes at a glance

Title	Size and structure	Summary purpose
Pearson BTEC Level 3 National Certificate in Computing	180 GLH (235 TQT) Equivalent in size to 0.5 of an A Level. 2 units, both mandatory, of which 1 is external. Mandatory content (100%). External assessment (50%).	This qualification is designed to be an introduction to the computing sector through applied learning. The qualification supports progression to higher education when taken as part of a programme of study that includes other vocational or general qualifications.
Pearson BTEC Level 3 National Extended Certificate in Computing	360 GLH (465 TQT) Equivalent in size to one A Level. 4 units of which 3 are mandatory and 2 are external. Mandatory content (83%). External assessment (58%).	This qualification is designed to support learners who are interested in learning about the computing sector alongside other fields of study, with a view to progressing to a wide range of higher education courses, not necessarily in the computing sector. It is designed to be taken as part of a programme of study that includes other appropriate BTEC Nationals or A Levels.
Pearson BTEC Level 3 National Foundation Diploma in Computing	510 GLH (670 TQT) Equivalent in size to 1.5 A Levels. 6 units of which 4 are mandatory and 2 are external. Mandatory content (76%). External assessment (41%).	This qualification is designed to support learners who wish to study computing as a one-year, full-time course, or for those wishing to take it alongside another area of complementary or contrasting study, as part of a two-year, full-time study programme. If taken as part of a programme of study that includes other appropriate BTEC Nationals or A Levels, it supports progression to higher education.
Pearson BTEC Level 3 National Diploma in Computing	720 GLH (960 TQT) Equivalent in size to two A Levels. 8 units of which 6 are mandatory and 3 are external. Mandatory content (83%). External assessment (46%).	This qualification is designed to support learners who want an in-depth study of the computing sector as part of a 16–19 study programme. This programme may include other BTEC Nationals or A Levels to support progression to higher education courses in computing areas before entering employment. The additional qualification(s) studied allow learners either to give breadth to their study programme by choosing a contrasting subject, or to give it more focus by choosing a complementary subject.
Pearson BTEC Level 3 National Extended Diploma in Computing	1080 GLH (1435 TQT) Equivalent in size to three A Levels. 13 units of which 7 are mandatory and 4 are external. Mandatory content (67%). External assessment (42%).	This qualification is designed to support learners who are interested in a two-year, full-time course that meets entry requirements for a course in computer-related study at higher education. The qualification enables learners to explore a choice of sector areas, enabling progression to either higher education or employment in the computing sector.

Structures of the qualifications at a glance

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

Key

Unit assessed externally	M	Mandatory units	O	Optional units
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Unit (number and title)	Unit size (GLH)	Certificate (180 GLH)	Extended Certificate (360 GLH)	Foundation Diploma (510 GLH)	Diploma (720 GLH)	Extended Diploma (1080 GLH)
1 Principles of Computer Science	120		M	M	M	M
2 Fundamentals of Computer Systems	90	M	M	M	M	M
3 Planning and Management of Computing Projects	120				M	M
4 Software Design and Development Project	120					M
5 Building Computer Systems	60					
6 IT Systems Security	60					
7 IT Systems Security and Encryption	90	M	M	M	M	M
8 Business Applications of Social Media	90			M	M	M
9 The Impact of Computing	90				M	M
10 Human-computer Interaction	60		O	O	O	O
11 Digital Graphics and Animation	60		O	O	O	O
12 Digital Audio	60				O	O
13 Digital Video	60				O	O
14 Computer Games Development	60		O	O	O	O
15 Website Development	60		O	O	O	O
16 Object-oriented Programming	60				O	O

continued overleaf

Unit (number and title)	Unit size (GLH)	Certificate (180 GLH)	Extended Certificate (360 GLH)	Foundation Diploma (510 GLH)	Diploma (720 GLH)	Extended Diploma (1080 GLH)
17 Mobile Apps Development	60		0	0	0	0
18 Relational Database Development	60				0	0
19 Computer Networking	60				0	0
20 Managing and Supporting Systems	60		0	0	0	0
21 Virtualisation	60				0	0
22 Systems Analysis and Design	60		0	0	0	0
23 Systems Methodology	60				0	0

Qualification and unit content

Pearson has developed the content of the new BTEC Nationals 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 attributes required in the sector.

Each qualification in the suite has its own purpose. The mandatory and optional content provides a balance of breadth and depth, while retaining a degree of choice for individual learners to study content relevant to their own interests and progression choices. Also, the content may be applied during delivery in a way that is relevant to local employment needs.

The proportion of mandatory content ensures that all learners are following a coherent programme of study and acquiring the knowledge, understanding and skills that will be recognised and valued. Learners are expected to show achievement across mandatory units as detailed in *Section 2*.

BTEC Nationals have always required applied learning that brings together knowledge and understanding (the cognitive domain) with practical and technical skills (the psychomotor domain). This is achieved through learners performing vocational tasks that encourage the development of appropriate vocational behaviours (the affective domain) and transferable skills. Transferable skills are those such as communication, teamwork, research and analysis, which are valued in both higher education and the workplace.

Our approach provides rigour and balance, and promotes the ability to apply learning immediately in new contexts. Further details can be found in *Section 2*.

Centres should ensure that delivery of content is kept up to date. Some of the units within the specification may contain references to legislation, policies, regulations and organisations, which may not be applicable in the country you deliver this qualification in (if teaching outside of England), or which may have gone out-of-date during the lifespan of the specification. In these instances, it is possible to substitute such references with ones that are current and applicable in the country you deliver subject to confirmation by your Standards Verifier.

Assessment

Assessment is specifically designed to fit the purpose and objective of the qualification. It includes a range of assessment types and styles suited to vocational qualifications in the sector. There are three main forms of assessment that you need to be aware of: external, internal and synoptic.

Externally-assessed units

Each external assessment for a BTEC National is linked to a specific unit. All of the units developed for external assessment are of 90 or 120 GLH to allow learners to demonstrate breadth and depth of achievement. Each assessment is taken under specified conditions, then marked by Pearson and a grade awarded. Learners are permitted to resit external assessments during their programme. You should refer to our website for current policy information on permitted retakes.

The styles of external assessment used for qualifications in the computing suite are:

- examinations – all learners take the same assessment at the same time, normally with a written outcome
- set tasks – learners take the assessment during a defined window and demonstrate understanding through completion of a vocational task.

Some external assessments include a period of preparation using set information. External assessments are available twice a year. For detailed information on the external assessments please see the table in *Section 2*. For further information on preparing for external assessment see *Section 5*.

Internally-assessed units

Most units in the sector are internally assessed and subject to external standards verification. This means that you set and assess the assignments that provide the final summative assessment of each unit, using the examples and support that Pearson provides. Before you assess you will need to become an approved centre, if you are not one already. You will need to prepare to assess using the guidance in *Section 6*.

In line with the requirements and guidance for internal assessment, you select the most appropriate assessment styles according to the learning set out in the unit. This ensures that learners are assessed using a variety of styles to help them develop a broad range of transferable skills. Learners could be given opportunities to:

- write up the findings of their own research
- use case studies to explore complex or unfamiliar situations
- carry out projects for which they have choice over the direction and outcomes
- demonstrate practical and technical skills using appropriate tools/processes etc.

You will make grading decisions based on the requirements and supporting guidance given in the units. Learners may not make repeated submissions of assignment evidence. For further information see *Section 6*.

Synoptic assessment

Synoptic assessment requires learners to demonstrate that they can identify and use effectively, in an integrated way, an appropriate selection of skills, techniques, concepts, theories and knowledge from across the whole sector as relevant to a key task. BTEC learning has always encouraged learners to apply their learning in realistic contexts using scenarios and realistic activities that will permit learners to draw on and apply their learning. For these qualifications we have formally identified units which contain a synoptic assessment task. Synoptic assessment must take place after the teaching and learning of other mandatory units in order for learners to be able to draw from the full range of content. The synoptic assessment gives learners an opportunity to independently select and apply learning from across their programmes in the completion of a vocational task. Synoptic tasks may be in internally or externally assessed units. The particular unit that contains the synoptic tasks for this qualification is shown in the structure in *Section 2*.

Language of assessment

Assessment of the internal and external units for these qualifications will be available in English. All learner work must be in English. A learner taking the qualifications may be assessed in British or Irish Sign Language where it is permitted for the purpose of reasonable adjustment. For information on reasonable adjustments see *Section 7*.

Grading for units and qualifications

Achievement in the qualification requires a demonstration of depth of study in each unit, assured acquisition of a range of practical skills required for employment or progression to higher education, and successful development of transferable skills. Learners achieving a qualification will have achieved across mandatory units, including external and synoptic assessment.

Units are assessed using a grading scale of Distinction (D), Merit (M), Pass (P), Near Pass (N) and Unclassified (U). The grade of Near Pass is used for externally-assessed units only. All mandatory and optional units contribute proportionately to the overall qualification grade, for example a unit of 120 GLH will contribute double that of a 60 GLH unit.

Qualifications in the suite are graded using a scale of P to D*, **or** PP to D*D*, **or** PPP to D*D*D*. Please see *Section 9* for more details. The relationship between qualification grading scales and unit grades will be subject to regular review as part of Pearson's standards monitoring processes on the basis of learner performance and in consultation with key users of the qualification.

UCAS Tariff points

The BTEC Nationals attract UCAS points. Please go to the UCAS website for full details of the points allocated.

1 Qualification purpose

Pearson BTEC Level 3 National Certificate in Computing

In this section you will find information on the purpose of this qualification and how its design meets that purpose through the qualification objective and structure. We publish a full 'Statement of Purpose' for each qualification on our website. These statements are designed to guide you and potential learners to make the most appropriate choice about the size of qualification suitable at recruitment.

Who is this qualification for?

The Pearson BTEC Level 3 National Certificate in Computing gives an introduction to study of the sector. It is intended to be an Applied General qualification for post-16 learners with an interest in computing who wish to continue their education through applied learning. It aims to give learners transferable knowledge and skills for progression to higher education.

The qualification is equivalent in size to half an A Level and forms part of a study programme alongside other vocational and/or academic qualifications.

No prior study of the sector is needed but learners should normally have a range of achievement at Level 2, in GCSEs or equivalent qualifications.

What does this qualification cover?

The content of this qualification has been developed in consultation with academics to ensure that it supports progression to higher education. In addition, employers and professional bodies have been involved and consulted, in order to confirm that the content is also appropriate and consistent with current industry practice used in computing and related occupational disciplines.

All the content of this qualification is mandatory, with two units that focus on:

- fundamentals of computer systems
- IT security and encryption.

Learners will gain a basic introduction to the study of computing through knowledge and understanding of computer systems. Learners will develop a range of skills, techniques and personal attributes that will be valuable across all areas of future study and work.

What could this qualification lead to?

Learners who have completed this qualification in one year may progress to a larger-size BTEC National in the computing sector.

In addition to the sector-specific content, this qualification develops learners' transferable and higher-order skills that are highly regarded by higher education and employers.

The qualification carries UCAS points and is recognised by higher education providers as contributing to admission requirements for degree courses when taken alongside other Level 3 qualifications. It combines well with almost all subjects across the sciences, technology, arts and humanities as part of a programme of learning. Depending on the other qualifications learners have taken, they can progress to a degree from a wide range of programmes in the computing sector.

Learners should always check the entry requirements for degree programmes with specific higher education providers.

How does the qualification provide employability skills?

In the BTEC National units there are opportunities during the teaching and learning phase to give learners practice in developing employability skills. Where employability skills are referred to in this specification, we are generally referring to skills in the following three main categories:

- **cognitive and problem-solving skills:** use critical thinking, approach non-routine problems applying expert and creative solutions, use systems and technology
- **intrapersonal skills:** communicating, working collaboratively, negotiating and influencing, self-presentation
- **interpersonal skills:** self-management, adaptability and resilience, self-monitoring and development.

There are also specific requirements in some units for assessment of these skills where relevant. For example, where learners are required to undertake real or simulated activities.

How does the qualification provide transferable knowledge and skills for higher education?

All BTEC Nationals provide transferable knowledge and skills that prepare learners for progression to university. The transferable skills that universities value include:

- the ability to learn independently
- the ability to research actively and methodically
- being able to give presentations and being active group members.

BTEC learners can also benefit from opportunities for deep learning where they are able to make connections among units and select areas of interest for detailed study. BTEC Nationals provide a vocational context in which learners can develop the knowledge and skills required for particular degree courses, including:

- reading technical texts
- effective writing
- analytical skills
- creative development
- preparation for assessment methods used in degrees.

2 Structure

Qualification structure

Pearson BTEC Level 3 National Certificate in Computing

Mandatory units

There are two mandatory units, one internal and one external. Learners must complete and achieve at Near Pass grade or above for the external unit and at Pass or above for the internal unit.

Pearson BTEC Level 3 National Certificate in Computing				
Unit number	Unit title	GLH	Type	How assessed
2	Fundamentals of Computer Systems	90	Mandatory	External
7	IT Systems Security and Encryption	90	Mandatory and Synoptic	Internal

External assessment

This is a summary of the type and availability of external assessment, which is of units making up 50% of the total qualification GLH. See *Section 5* and the units and sample assessment materials for more information.

Unit	Type	Availability
Unit 2: Fundamentals of Computer Systems	<ul style="list-style-type: none">• Written examination set and marked by Pearson.• 80 marks.• 1 hour and 45 minutes.	Jan and May/June First assessment Jan 2018

Synoptic assessment

The mandatory synoptic assessment requires learners to apply learning from across the qualification to the completion of a defined vocational task. Within the assessment for *Unit 7: IT Systems Security and Encryption* learners complete reports relating to issues with IT security and produce a plan to protect an IT system. This will draw together underpinning knowledge of computer systems, as well as the needs and expectations of clients.

In assessing the unit assignments will require learners to select from and apply their learning from across their programme. The unit provides further information.

Learners complete the task using knowledge and understanding from their studies of the sector and apply both transferable and specialist knowledge and skills.

Employer involvement in assessment and delivery

You are encouraged to give learners opportunities to be involved with employers. See *Section 4* for more information.

3 Units

Understanding your units

The units in this specification set out our expectations of assessment in a way that helps you to prepare your learners for assessment. The units help you to undertake assessment and quality assurance effectively.

Each unit in the specification is set out in a similar way. There are two types of unit format:

- internal units
- external units.

This section explains how the units work. It is important that all teachers, assessors, internal verifiers and other staff responsible for the programme review this section.

Internal units

Section	Explanation
Unit number	The number is in a sequence in the sector. Numbers may not be sequential for an individual qualification.
Unit title	This is the formal title that we always use and it appears on certificates.
Level	All units are at Level 3 on the national framework.
Unit type	This shows if the unit is internal or external only. See structure information in <i>Section 2</i> for full details.
GLH	Units may have a GLH value of 120, 90 or 60 GLH. This indicates the numbers of hours of teaching, directed activity and assessment expected. It also shows the weighting of the unit in the final qualification grade.
Unit in brief	A brief formal statement on the content of the unit that is helpful in understanding its role in the qualification. You can use this in summary documents, brochures etc.
Unit introduction	This is designed with learners in mind. It indicates why the unit is important, how learning is structured, and how learning might be applied when progressing to employment or higher education.
Learning aims	These help to define the scope, style and depth of learning of the unit. You can see where learners should be learning standard requirements ('understand') or where they should be actively researching ('investigate'). You can find out more about the verbs we use in learning aims in <i>Appendix 2</i> .
Summary of unit	This new section helps teachers to see at a glance the main content areas against the learning aims and the structure of the assessment. The content areas and structure of assessment are required. The forms of evidence given are suitable to fulfil the requirements.
Content	This section sets out the required teaching content of the unit. Content is compulsory except when shown as 'e.g.'. Learners should be asked to complete summative assessment only after the teaching content for the unit or learning aim(s) has been covered.

Section	Explanation
Assessment criteria	<p>Each learning aim has Pass and Merit criteria. Each assignment has at least one Distinction criterion.</p> <p>A full glossary of terms used is given in <i>Appendix 2</i>. All assessors need to understand our expectations of the terms used.</p> <p>Distinction criteria represent outstanding performance in the unit. Some criteria require learners to draw together learning from across the learning aims.</p>
Essential information for assignments	<p>This shows the maximum number of assignments that may be used for the unit to allow for effective summative assessment, and how the assessment criteria should be used to assess performance.</p>
Further information for teachers and assessors	<p>The section gives you information to support the implementation of assessment. It is important that this is used carefully alongside the assessment criteria.</p>
Resource requirements	<p>Any specific resources that you need to be able to teach and assess are listed in this section. For information on support resources see <i>Section 10</i>.</p>
Essential information for assessment decisions	<p>This information gives guidance for each learning aim or assignment of the expectations for Pass, Merit and Distinction standard. This section contains examples and essential clarification.</p>
Links to other units	<p>This section shows you the main relationship among units. This section can help you to structure your programme and make best use of materials and resources.</p>
Employer involvement	<p>This section gives you information on the units that can be used to give learners involvement with employers. It will help you to identify the kind of involvement that is likely to be successful.</p>

External units

Section	Explanation
Unit number	The number is in a sequence in the sector. Numbers may not be sequential for an individual qualification.
Unit title	This is the formal title that we always use and it appears on certificates.
Level	All units are at Level 3 on the national framework.
Unit type	This shows if the unit is internal or external only. See structure information in <i>Section 2</i> for full details.
GLH	Units may have a GLH value of 120, 90 or 60 GLH. This indicates the numbers of hours of teaching, directed activity and assessment expected. It also shows the weighting of the unit in the final qualification grade.
Unit in brief	A brief formal statement on the content of the unit.
Unit introduction	This is designed with learners in mind. It indicates why the unit is important, how learning is structured, and how learning might be applied when progressing to employment or higher education.
Summary of assessment	This sets out the type of external assessment used and the way in which it is used to assess achievement.
Assessment outcomes	These show the hierarchy of knowledge, understanding, skills and behaviours that are assessed. Includes information on how this hierarchy relates to command terms in sample assessment materials (SAMs).
Essential content	For external units all the content is obligatory, the depth of content is indicated in the assessment outcomes and sample assessment materials (SAMs). The content will be sampled through the external assessment over time, using the variety of questions or tasks shown.
Grade descriptors	We use grading descriptors when making judgements on grade boundaries. You can use them to understand what we expect to see from learners at particular grades.
Key terms typically used in assessment	These definitions will help you analyse requirements and prepare learners for assessment.
Resources	Any specific resources that you need to be able to teach and assess are listed in this section. For information on support resources see <i>Section 10</i> .
Links to other units	This section shows the main relationship among units. This section can help you to structure your programme and make best use of materials and resources.
Employer involvement	This section gives you information on the units that can be used to give learners involvement with employers. It will help you to identify the kind of involvement that is likely to be successful.

Index of units

This section contains all the units developed for this qualification. Please refer to *pages 5–6* to check which units are available in all qualifications in the computing sector.

Unit 2: Fundamentals of Computer Systems	19
Unit 7: IT Systems Security and Encryption	29

Unit 2: Fundamentals of Computer Systems

Level: **3**

Unit type: **External**

Guided learning hours: **90**

Unit in brief

Learners study the fundamental principles of how computer systems work, including the role of hardware and software, the way components of a system work together and how data in a system is used.

Unit introduction

Knowing how and why computer components, and the data they use, perform in certain ways has a significant impact on the work of all computing professionals. In technical support roles, understanding how different parts of a system integrate facilitates accurate identification of problems and efficient solutions. Professional programmers use their understanding of the way the computer operates to develop more efficient software solutions.

In this unit, you will explore the relationship between hardware and software as part of a computer system. You will examine the way computer components work both individually and together to store and process data, and the way in which data is transmitted and used in computer systems. You will explore the impact that computing systems have on organisations and individuals.

In this unit, you will apply the fundamental principles of computers to all areas of computing. This is essential for progression to a computing-related higher education course or for entry to the workplace as a computing professional.

Summary of assessment

This unit is assessed through a written examination set and marked by Pearson.

The examination is one hour and 45 minutes in length. During the supervised assessment period, learners will be assessed on their knowledge and understanding of how computer systems work, including the role of hardware and software, the way components of a system work together and how data in a system is used.

The number of marks for the unit is 80.

The assessment availability is twice a year in January and May/June. The first assessment availability is January 2018.

Assessment outcomes

AO1 Demonstrate knowledge and understanding of computing facts, terms, standards, concepts and processes

Command words: complete, draw, give, identify, name, state

Marks: ranges from 1 to 5 marks

AO2 Apply knowledge and understanding of computing facts, terms, standards, concepts and processes to real-life scenarios

Command words: calculate, complete, demonstrate, describe, draw, explain, produce

Marks: ranges from 1 to 5 marks

AO3 Select and use computing technologies and procedures to explore likely outcomes and find solutions to problems in context

Command words: calculate, demonstrate, develop, explain, produce

Marks: ranges from 1 to 6 marks

AO4 Analyse and evaluate data, information, technologies and procedures in order to recommend and justify solutions to computing problems

Command words: analyse, demonstrate, discuss, produce, write

Marks: ranges from 6 to 12 marks

AO5 Make connections between the application of technologies, procedures, outcomes and solutions to resolve computing problems

Command words: evaluate, produce, write

Marks: ranges from 6 to 12 marks

Essential content

The essential content is set out under content areas. Learners must cover all specified content before the assessment.

A Hardware and software

The concepts and implications of the use of, and relationships between, hardware and software that form computer systems.

A1 Computer hardware in a computer system

- Types of computer systems:
 - multi-functional devices
 - personal computers
 - mobile devices
 - servers.
- The purpose, features and uses of internal components used in:
 - multi-functional devices
 - personal computers
 - mobile devices
 - servers.
- Factors affecting the choice, use and performance of internal components.
- The hardware used in computer systems:
 - input devices
 - output devices
 - storage devices.
- How the features of hardware can affect their performance and the performance of a computer system.
- Factors affecting choice of hardware:
 - user experience – ease of use, performance, availability, accessibility
 - user needs
 - compatibility
 - cost
 - efficiency
 - implementation – timescales, testing, migration to new system
 - productivity
 - security.
- Data storage and recovery systems:
 - redundant array of independent disks (RAID)
 - network attached storage (NAS).

A2 Computer software in a computer system

- Operating systems:
 - types of operating system:
 - real-time operating system
 - single-user single task
 - single-user multi-tasking
 - multi-user

- the role of the kernel in controlling and managing system components and tasks:
 - program execution
 - interrupts
 - modes
 - memory management
 - multi-tasking
 - disk access
 - file systems
 - device drivers
- the role of the operating system in managing:
 - networking
 - security
- factors affecting the choice and use of user interfaces:
 - graphical
 - command line
 - menu based
- factors affecting the choice of operating system
- factors affecting the use and performance of an operating system.
- Utility software:
 - the purpose, features and uses of utility software
 - factors affecting the choice, use and performance of utility software.
- Application software:
 - the purpose, features and uses of application software
 - factors affecting the choice, use and performance of application software.
- The principles and implications of open source operating systems and software.

A3 Data processing

- The use, features and implications of computer systems for data processing.
- The role of hardware in collecting data.
- The role of software in collecting data.
- Data processing functions:
 - aggregation
 - analysis
 - conversion
 - reporting
 - sorting
 - validation.
- The impact on individuals and organisations of using and storing data across multiple computer systems:
 - access
 - cost
 - implementation
 - productivity
 - security.
- Backup and data recovery procedures.

B Computer architecture

The implications of computer architecture models and the impact of the relationships between their component parts.

B1 Approaches to computer architecture

- The features and characteristics of different computer architecture models:
 - stored program model:
 - Von Neumann architecture
 - Harvard architecture
 - cluster computing
 - uniform memory access and non-uniform memory access.
- Use and application of emulation.
- Factors affecting the choice of different architecture models.
- The impact of using different architecture models.

B2 The concepts of microarchitecture

- Instruction cycles.
- Execution speeds:
 - factors affecting execution speeds
 - methods of increasing execution speed
 - implications of execution speeds.
- The use and choice of instruction sets.
- Pipelining.
- Cache.
- Registers.
- Multi-processing and multi-threading.
- The features and implications of embedded and mobile central processing unit (CPU) architecture.
- The features and implications of microcomputer CPU architecture.
- The features and implications of server CPU architecture.

B3 Registers and register handling

- Types of register:
 - general purpose register
 - special registers:
 - accumulator
 - instruction register
 - memory address register (MAR)
 - memory data register (MDR)
 - program counter.
- The function and purpose of general and special registers and their impact on the way computer systems perform.
- The role of interrupts in a computer system.

C How data is represented by computer systems

The characteristics, concepts and implications of computer data representation methods.

C1 Number systems

- The use and interpretation of number systems used in computer systems, including:
 - units of digital data (bit, byte, kilobyte and multiples of these)
 - binary
 - binary coded decimal (BCD).
- The use of binary arithmetic (including BCD) to perform calculations: addition, subtraction, multiplication and division.
- The use of binary to represent negative and floating point numbers.

C2 Text representation

- The purpose and implications of using codes to represent character sets.
- The features and uses of common character sets:
 - ASCII
 - UNICODE.

C3 Image representation

- How bitmap/raster image data is stored and represented in a computer system.
- The impact of image resolution on the way images are stored and represented.
- The impact of sample/bit depth on the way that image data is stored and images are displayed.
- The effects of compression on image data.

D How data is organised on computer systems

The characteristics and implications of methods of organising data in computer systems, and its impact on computer processes.

D1 Data structures

- The features, applications and implications of data types used in computer systems:
 - stack
 - queue
 - array
 - list.
- The use and application of data types in computer software.
- The use and implications of data types in computer hardware.

D2 Indices and matrices

Matrix representation in computer systems:

- the relationship between matrices and arrays
- mathematical operations using matrices
- single, two- and multi-dimensional arrays
- row-major and column-major order.

E How data is transmitted by computer systems

The concepts, processes and implications of data transmission in and between computer systems.

E1 Transmitting data

- Types of communication channel:
 - simplex
 - half-duplex
 - full-duplex
 - point-to-point
 - multi-drop.
- Methods of connecting devices and transmitting data across and between computer systems.
- The selection of connection methods to fulfil specified tasks and functions.
- Asynchronous and synchronous data transmission.
- Parallel and serial transmission.
- Use of packet data in transmitting data:
 - contents of a data packet
 - the role of components of a data packet
 - packet switching.
- Protocols used to govern and control data transmission.

- The features, applications and implications of encryption
 - simple encryption ciphers:
 - Caesar cipher
 - Vigenère cipher
 - encryption used in computer systems:
 - symmetric key encryption
 - public key encryption.
- Types of compression:
 - lossy
 - lossless.
- The applications and implications of data compression.

E2 Error detection

- Methods used to detect errors in data transmission:
 - parity schemes
 - checksum
 - repetition schemes
 - cyclic redundancy check (CRC).
- The concepts, implications and applications of error detection.

E3 Error correction

- Commonly-used error correction systems:
 - automatic repeat request (ARQ)
 - forward error correction (FEC).
- The concepts, implications and applications of error correction systems.

F The use of logic and data flow in computer systems

The use, application and interpretation of logical processes and diagrams to represent data flow and relationships in and between computer systems.

F1 Boolean logic

- The use, application and interpretation of Boolean logic to identify data flow and solve problems.
- The use, application and interpretation of Boolean logic to identify logical structures, represent data flow and solve problems.

F2 Flow charts and system diagrams

- The use, application and interpretation of flow charts and diagrams to represent data flow in and between computer systems.
- The use, application and interpretation of flow charts and diagrams to solve problems.

Grade descriptors

To achieve a grade a learner is expected to demonstrate these attributes across the essential content of the unit. The principle of best fit will apply in awarding grades.

Level 3 Pass

Learners are able to apply knowledge and understanding of key computing concepts to a range of familiar vocational contexts. They are able to use knowledge of computing to deconstruct problems in common situations and apply standard conventions to produce solutions with interpretation. Learners are able to identify the impact of effective and ineffective computer systems and recommend ways in which a system can be developed and/or improved (using given structures and criteria).

Level 3 Distinction

Learners are able to analyse complex information, data and situations, in vocational contexts, in order to draw conclusions and make valid observations. They are able to synthesise knowledge and understanding of computing to deconstruct problems, drawing on various sources of information to develop effective solutions with justification. Learners are able to evaluate the effectiveness of computer systems to make justified recommendations on their development and future actions that can be taken.

Key terms typically used in assessment

The following table shows the key terms that will be used consistently by Pearson in our assessments to ensure students are rewarded for demonstrating the necessary skills.

Please note: the list below will not necessarily be used in every paper/session and is provided for guidance only.

Command or term	Definition
Analyse	Learners examine in detail, a scenario or problem to discover its meaning or essential features. Learners will break down the problem into its parts and show how they interrelate. There is no requirement for any conclusion.
Calculate	Learners apply some form of mathematical or computational process.
Complete	Learners complete a diagram or process. Can apply to problems/solutions of varying complexity.
Demonstrate	Learners illustrate and explain how an identified computer system or process functions. May take the form of an extended writing response, a diagram or a combination of the two.
Describe	Learners provide an account of something, or to highlight a number of key features of a given topic. May also be used in relation to the stages of a process.
Develop	Learners provide a solution to a problem, typically using an existing system or structure that must be improved or refined.
Discuss	Learners investigate a problem or scenario, showing reasoning or argument.
Draw	Learners represent understanding through the use of a diagram or flow chart.
Evaluate	Learners review and synthesise information to provide a supported judgement about the topic or problem. Typically a conclusion will be required.
Explain	Learners make a series of linked points and/or justify or expand on an identified point.
Identify	Learners assess factual information, typically when making use of given stimuli. Requires a single word or short sentence answer.
Produce	Learners provide a solution that applies established constructs to a given computing problem.
Write	Learners produce a solution, or a mechanism used as part of a solution, to a given computing problem.

Links to other units

This mandatory unit supports most of the other units in the qualification and, in particular, the following mandatory units:

- Unit 3: Planning and Management of Computer Projects
- Unit 4: Software Design and Development Project
- Unit 7: IT Systems Security and Encryption
- Unit 9: The Impact of Computing.

Employer involvement

Centres may involve employers in the delivery of this unit if there are local opportunities. There is no specific guidance related to this unit.

Unit 7: IT Systems Security and Encryption

Level: **3**

Unit type: **Internal**

Guided learning hours: **90**

Unit in brief

Learners will study IT system security threats and the methods used to protect against them. Learners undertake activities to protect IT systems from security threats, including data encryption.

Unit introduction

Our increasing reliance on computer systems makes us vulnerable to a range of attacks from cyber criminals. On a global scale, some conflicts reveal that IT systems are now a target. As IT system security defences become more robust, attack methods become more sophisticated. IT professionals require a good understanding of current security threats and of how to apply appropriate protection methods for any given situation. They also need to comply with legal requirements at all times.

In this unit, you will investigate the many different types of security attack, the vulnerabilities that exist and techniques that can be used to defend the IT systems of organisations. Many organisations run complex IT networks and need them to be secure while providing a safe environment for their employees to work, sharing some data and keeping other data private. You will learn about the complexities of configuring and supporting these networks. You will also explore how encryption can be used to protect data. You will plan and apply suitable protection to an IT system and test it to ensure the protection is effective. You will configure an IT system's access control settings to control user access to various IT system resources, including files, folders and printers. Finally, you will review the protection that you have applied to an IT system and consider how effective it might be in defending the system from attack. To complete the assessment task within this unit, you will need to draw on your learning from across your programme.

It is important that all IT professionals have a good understanding of security issues and how to defend IT systems against increasingly sophisticated attacks. This unit will prepare you for professional practice as well as entry to a higher education programme that contains elements of cyber security.

Learning aims

In this unit you will:

- A** Understand current IT security threats, information security and the legal requirements affecting the security of IT systems
- B** Investigate cryptographic techniques and processes used to protect data
- C** Examine the techniques used to protect an IT system from security threats
- D** Implement strategies to protect an IT system from security threats.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand current IT security threats, information security and the legal requirements affecting the security of IT systems	A1 Threat types A2 Computer network-based threats A3 Information security A4 Legal requirements A5 Impact of security breaches	A report explaining different IT security threats, their potential impact on organisations and the principles of information security and why organisations must adhere to legal requirements when considering security.
B Investigate cryptographic techniques and processes used to protect data	B1 Cryptographic principles B2 Cryptographic methods B3 Applications of cryptography	<p>A report explaining the principles and uses of cryptography, and an assessment of the impact of encryption and security protection, in general, on security and legal issues.</p> <p>An evaluation of the effectiveness of different protection techniques.</p>
C Examine the techniques used to protect an IT system from security threats	C1 Physical security C2 Policies and procedures C3 Software-based protection	Detailed testing documentation explaining how protection techniques can help defend an organisation and a plan showing the protection to be applied to a system to meet specific requirements.
D Implement strategies to protect an IT system from security threats	D1 Group policies D2 Anti-malware protection D3 Firewall configuration D4 Wireless security D5 Access control D6 Testing and reviewing protection applied to an IT system D7 Skills, knowledge and behaviours	<p>Annotated photographic/video evidence of protection measures applied to an IT system.</p> <p>Completed review of the protected IT system.</p> <p>Annotated photographic/video evidence of improvements and optimisations being made to an IT system.</p> <p>Written or audio/video recorded justification of planning decisions and an evaluation of the protected IT system.</p> <p>A report evaluating the plan and the protected system against the requirements.</p>

Content

Learning aim A: Understand current IT security threats, information security and the legal requirements affecting the security of IT systems

A1 Threat types

Current security threats and techniques (which are continually evolving), including:

- internal threats, e.g. employee actions, data theft, accidental loss, unintentional disclosure or damage to data, unsafe practices (use of external flash storage, visiting untrusted websites, downloading/uploading files to/from the internet, users overriding security controls, file sharing apps and bring your own device (BYOD))
- external threats, e.g. data theft, destruction, withholding and/or disruption of systems (by competitors, cyber criminals, governments, terrorists) for political purposes or financial gain
- physical threats, e.g. theft of equipment or data, malicious damage to equipment or data, damage or destruction by fire, flood, terrorist action or other disaster
- social engineering and software-driven threats, techniques used to obtain secure information (software that has a malicious intent), e.g. malware, viruses, worms, Trojan horses, ransomware, spyware, adware, rootkits and backdoors.

A2 Computer network-based threats

- Passive threats, including wiretapping, port scanning and idle scanning.
- Active threats, including denial-of-service attack, spoofing, man in the middle, Address Resolution Protocol (ARP) poisoning, smurf attack, buffer overflow, heap overflow, format string attack, Structured Query Language (SQL) injection and cyber attack.
- Cloud computing security risks.

A3 Information security

- Principles of confidentiality, integrity and availability of information.
- Unauthorised access or modification of information.
- Principle of minimal access to information or lowest required access permission to be able to maximise protection.
- Deliberate or accidental loss of information.
- The need to protect intellectual property from theft or malicious damage, e.g. personal information, bank account details, employment details.

A4 Legal requirements

Legislation must be current and applicable to England, Wales or Northern Ireland, as appropriate to where the qualification is being taught.

- Data protection legislation and the requirements it places on organisations to keep data about stakeholders secure.
- Computer misuse legislation and its definitions of illegal practices and applications.
- Copyright, designs and patents legislation and its requirements in terms of protecting software products and digital media such as music and films.
- Telecommunications (Lawful Business Practice) (Interception of Communications) regulations and their requirement to allow companies to monitor employee communication using IT systems and other uses of the internet while at work.
- Fraud legislation and its requirement to deal with services using IT-based methods to steal information for fraudulent purposes.
- Legal liability and contractual obligations.

A5 Impact of security breaches

A serious security breach is likely to result in one or more of the following:

- operational impact on an organisation of the loss of data or service
- financial impact of loss of service, such as an e-commerce website
- damage to reputation
- legal consequences of data privacy breaches
- forensics research requirements to identify data lost, stolen or copied.

Learning aim B: Investigate cryptographic techniques and processes used to protect data**B1 Cryptographic principles**

- The principles and uses of encryption, including digital rights management (DRM); password storing and salts; obfuscation and steganography; secure transactions; two-factor authentication; file, folder, disk encryption; encryption of communication data, e.g. police, mobile phone.
- Legal and ethical issues.
- Computational hardness assumption.

B2 Cryptography methods

Key cryptography methods, e.g.:

- shift ciphers, one-time pads, hash functions (e.g. MD4, MD5, SHA-2, SHA-3), block ciphers, stream ciphers
- cryptographic primitives, e.g. pseudo random functions, one-way functions
- cryptographic salts and their use in storing passwords
- encryption algorithms, e.g. RSA, DES, 3DES
- mathematical principles, integer factorisation, prediction of prime numbers.

B3 Applications of cryptography

The types and application of cryptography, including:

- symmetric key encryption
- public key encryption
- key exchanges (Diffe-Hellman)
- digital certificates (including certificate authorities)
- HTTPS protocol
- virtual private networks (VPNs)
- Generic Routing Encapsulation (GRE) tunnels
- encryption of data on Wi-Fi networks.

Learning aim C: Examine the techniques used to protect an IT system from security threats

Protection techniques, to include physical security, policies and procedures, software-based protection and regular audit of security.

C1 Physical security

- Building and computer/network room security, e.g. door locks, card key entry, closed circuit television (CCTV), voice control and biometrics such as facial recognition, fingerprint and iris scans, DNA identification technology.
- Servers, routers, switches kept in a secure location with controlled access.
- Backing up data, e.g. full backup, differential and incremental backups, use of a fire safe and off-site storage of data.
- IT disaster recovery plans for use when an organisation's IT systems become unavailable.

C2 Policies and procedures

Relevant policies and procedures, including:

- organisational policies and their application, including internet and email use policies, security and password procedures, staff responsibilities, training of staff on IT security issues, disciplinary procedures
- security audits and their application to check compliance of policies and procedures
- default 'factory settings' and 'reset' options are removed from hardware and software configuration
- any known backdoors are removed
- management of patches for hardware (firmware) and software (operating systems, security applications)
- installation of applicable security updates, including rollout management, minimising disruption, sandbox testing of updates and establishing potential risks
- any rules created do not impede normal business operation for an individual and the organisation:
 - ingress and egress of expected network traffic
 - server interconnectivity
 - time based, allowing/preventing resource access
 - allowing external access to internal servers
 - allowing data interchange between suppliers, business partners, external cloud-based solutions
 - the impact of aggressive email filters
 - use of different software by different individuals.

C3 Software-based protection

- Anti-virus software and detection techniques, including virus signatures, heuristic techniques used to identify potentially suspicious file content, techniques for dealing with identified threats.
- Software and hardware firewalls and the filtering techniques they use, including packet filtering, inbound and outbound rules, and network address translation.
- Intrusion detection systems (IDSs), including setting signatures, establishing requirements, traffic monitoring.
- Domain management, including prevention of unintended devices joining a system.
- User authentication, including user log-on procedures, strong passwords, text and graphical passwords, biometric authentication, two-step verification, security tokens (e.g. USB-based keys), knowledge-based authentication (e.g. question and response pairs), Kerberos network authentication for Windows® and Linux®-based systems, certificate-based authentication.
- Access controls and the methods they use to restrict authorised/unauthorised users access to resources (user groups and the access rights allocated to them such as folders, files and physical resource such as printers), e.g. Windows NTFS file permissions, Linux octal file permissions.

Learning aim D: Implement strategies to protect an IT system from security threats

D1 Group policies

- Tools for managing a set of IT systems.

D2 Anti-malware protection

- Installation of anti-malware software, configuration of anti-malware scanning schedules.

D3 Firewall configuration

Hardware and/or operating system-embedded firewalls, including configuration of:

- inbound and outbound rules to control network connections that are allowed and prevent all other unauthorised connections
- firewall events and interpretation of log entries.

D4 Wireless security

- Wireless encryption methods, e.g. Wired Equivalent Privacy (WEP), Wi-Fi Protected Access (WPA), WPA2.
- Configuration of wireless router security settings.

D5 Access control

- Design and implementation of hardware and software access control regimes, including permission settings on files, folders and resources.
- Defining legitimate users and groups, and the resources they need to access and the levels of access they need (read, modify, delete).
- Defining password policies, including length, complexity, age and reuse for desktop and server computers.
- White listing of applications' trusted signed binaries.
- Data hiding when viewing logs and visibility of sensitive data.
- Defining users with special privileges, e.g. administrator rights and when these are used.

D6 Testing and reviewing protection applied to an IT system

- Firewall testing to check the firewall blocks unauthorised traffic and allows legitimate traffic through.
- Systematically test 'allowed' and 'blocked' entry points.
- Run system scans of all relevant hardware and software on a secured system using common testing tools.
- Network testing tools, including scanners, security-based operating system distribution, sniffers.
- Viewing and interpreting activity logs.
- Judging the effectiveness of protection and making recommendations for further improvements.

D7 Skills, knowledge and behaviours

- Planning and recording, including the setting of relevant targets with timescales, and how and when feedback from others will be gathered.
- Reviewing and responding to outcomes, including feedback from IT professionals and users, e.g. effectiveness of protection, degree to which the protection hinders the system's everyday use.
- Demonstrate own behaviours and their impact on outcomes, including professionalism, etiquette, being supportive of others, timely and appropriate leadership, accountability.
- Evaluating outcomes to help inform high-quality, justified recommendations and decisions.
- Documenting processes and outcomes, e.g. diary notes, planning documents, witness testimonies and discussion notes or recordings.
- Communication skills, including:
 - conveying intended meaning, e.g. written (email, design documentation, recording documentation, reports, visual aids for use in presentations use); verbal communication requirements (one-to-one and group informal and formal situations)
 - use of tone and language for verbal and written communications to convey intended meaning and make a positive and constructive impact on the audience, e.g. positive and engaging tone, technical/vocational language suitable for intended audience, avoidance of jargon.
 - responding constructively to the contributions of others, e.g. being supportive, managing contributions so all have the opportunity to contribute, responding to objections, managing expectation, resolving conflict.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand current IT security threats, information security and the legal requirements affecting the security of IT systems		AB.D1 Evaluate the effectiveness of the techniques used to protect organisations from security threats while taking account of the principles of information security and legal requirements.
A.P1 Explain the different security threats that can affect the IT systems of organisations.	A.M1 Assess the impact that IT security threats can have on organisations' IT systems and business while taking account of the principles of information security and legal requirements.	
A.P2 Explain the principles of information security when protecting the IT systems of organisations.		
A.P3 Explain why organisations must adhere to legal requirements when considering IT systems security.		
Learning aim B: Investigate cryptographic techniques and processes used to protect data		
B.P4 Explain the principles and uses of cryptography to secure and protect data.	B.M2 Analyse how the principles and uses of cryptography impact the security and protection of data.	
Learning aim C: Examine the techniques used to protect an IT system from security threats		CD.D2 Evaluate the plan and the effectiveness of the protected IT system against requirements. CD.D3 Demonstrate individual responsibility and effective self-management in the planning and protection of an IT system.
C.P5 Explain how protection techniques can help defend an organisation from security threats.	C.M3 Justify the choice of protection techniques used to defend the IT systems of an organisation, showing how its IT system will be protected from security threats.	
C.P6 Produce a plan to protect an IT system that meets organisational and legislative requirements.		
Learning aim D: Implement strategies to protect an IT system from security threats		
D.P7 Perform tasks to protect the IT system to meet requirements given in the plan.	D.M4 Enhance the protection of the IT system to meet requirements given in the plan.	
D.P8 Review the extent to which the organisation's IT system has been protected.		

Essential information for assignments

The recommended structure of assessment is shown in the unit summary with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aims: A and B (A.P1, A.P2, A.P3, B.P4, A.M1, B.M2, AB.D1)

Learning aims: C and D (C.P5, C.P6, D.P7, D.P8, C.M3, D.M4, CD.D2, CD.D3)

Further information for teachers and assessors

Resource requirements

As IT security is a very fast-moving discipline, regular research will be needed to keep learning delivery up to date – for example any changes to legislation applicable to IT security and the protection of IT systems and organisations.

For this unit, learners must have access to hardware and software resources that will allow them to apply security protection measures. Examples include computer systems, laptops or a virtualised environment, providing that they do not compromise the security of other 'live' systems. Learners may also need access to networking hardware such as a switch, wireless access point and router.

Essential information for assessment decisions

Learning aims A and B

For distinction standard, learners will provide comprehensive evidence that they have fully investigated and considered how effective security protection measures are likely to be in defending the IT systems of organisations against the security threats that they have been examining. Learners must discuss the protection techniques that are likely to be effective and those that are not, explaining why each technique would or would not be effective. They will make links between the effects of the security threats identified in their investigation, the effectiveness of the protection, the legal requirements (for example to keep personal data secure) and the information security requirements, as listed in the unit content. The evidence will demonstrate high-quality written or oral communication through the use of accurate and fluent technical vocabulary, which supports a well-structured and considered response that clearly connects chains of reasoning.

For merit standard, learners will provide a clear, balanced assessment of the potential impact of a wide range of IT security threats to organisations that rely on IT systems. Learners will refer to real-life examples of how security breaches have impacted on organisations.

Learners must provide a clear, balanced analysis of how the principles and uses of cryptography impact on the security and protection of data. For example, encryption techniques can have different strengths of protection, with the risk that some are more vulnerable than others. The evidence must be technically accurate and demonstrate good-quality written communication.

For pass standard, learners will provide detailed explanations of the various IT security threats, including why IT systems are vulnerable or not, as the case may be. Learners must cover internal, external, physical, social engineering and software threats. They also need to cover the principles of information security and the legal requirements that apply to an organisation's IT systems. For example, learners could explain how access control methods can help organisations comply with data protection and privacy laws and organisational requirements for confidentiality. They could also explain how company IT policies can make it clear to employees that employers have the right to monitor their emails and internet use at work. When covering the principles and uses of cryptography, learners will provide detailed technical explanations. The evidence may have some inaccuracies.

Learning aims C and D

For distinction standard, learners will draw on, and show synthesis of, knowledge across the learning aims to evaluate their plan, measure the effectiveness of the security protection methods applied to the IT system and refer to how their solution met the stated requirements. For example, learners have chosen to apply specific access controls for certain users, they would need to show how effective this measure is in terms of granting access to the right users and preventing access to others. Learners must also include what they have done differently where measures have been ineffective. Evidence must include results of testing carried out on the security that has been applied, as well as a review of planning against the implementation of the protection.

Learners will articulate their arguments and views concisely and professionally, and evaluate concepts, ideas and actions to reach reasoned and valid conclusions when justifying planning and implementing decisions in the protection of an IT system. They will demonstrate individual responsibility for their own work (for example identifying potential issues and resolving these, reviewing their work and making improvements, keeping their work safe and secure and showing responsible use of quoted materials) and effective self-management when planning and applying security protection methods to an IT system, including how they have handled breaches. They can also show awareness of how this is managed by organisations – for example, Product Security Incident Response Teams (PSIRTs). Learners must provide evidence of their methods of working, which can be diary notes, planning documents, witness testimonies, and discussion notes or recordings.

For merit standard, learners will provide a clear, reasoned justification of choices they have made in the planning of the security protection techniques they intend to use. This must include technical reasons why they selected particular protection methods and configurations and rejected others. Learners also need to show that they have carried out tasks that improve the protection provided and minimise the impact of the protection techniques on overall system performance and usability. This could include tasks such as setting scheduled virus scans and updates at appropriate times, adjusting firewall settings to unblock legitimate programs, and adjusting shared folder permissions and password policies to balance protection and convenience.

For pass standard, learners will produce a detailed, realistic plan that clearly shows what they intend to do to protect the IT system from a range of IT security threats. They must provide evidence of implementing the plan on a mock-up or virtualised system. Learners will provide a completed test plan to show that the IT system and its protection have been tested to ensure that the protection is effective and does not hinder the normal use of the system. The system must provide levels of access to folders as required by the organisation. Learners also need to provide evidence that the protected system has been reviewed by others, considering the protection provided and the usability of the system. The evidence could take the form of a written review or a video recorded discussion of the system. Learners must produce a solution that meets the requirements of the plan, although some minor issues may persist.

Links to other units

This assessment for this unit should draw on knowledge, understanding and skills developed from:

- Unit 1: Principles of Computer Science
- Unit 2: Fundamentals of Computer Systems
- Unit 3: Planning and Management of Computing Projects
- Unit 4: Software Design and Development Project
- Unit 8: Business Applications of Social
- Unit 9: The Impact of Computing.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local organisations/businesses
- contribution of design/ideas to unit assignment/scenario/case study/project materials, including own organisation/business materials as exemplars where appropriate
- feedback from staff from local organisations/businesses on plans/designs/items developed
- opportunities for observation of organisational/business application during work experience
- support from local organisation/business staff as mentors.

4 Planning your programme

How do I choose the right BTEC National qualification for my learners?

BTEC Nationals come in a range of sizes, each with a specific purpose. You will need to assess learners very carefully to ensure that they start on the right size of qualification to fit into their 16–19 study programme, and that they take the right pathways or optional units that allow them to progress to the next stage.

If a learner is clear that they want to progress to the workplace they should be directed towards an occupationally-specific qualification, such as a BTEC National Diploma, from the outset.

Some learners may want to take a number of complementary qualifications or keep their progression options open. These learners may be suited to taking a BTEC National Certificate or Extended Certificate. Learners who then decide to continue with a fuller vocational programme can transfer to a BTEC National Diploma or Extended Diploma, for example for their second year.

Some learners are sure of the sector they want to work in and are aiming for progression into that sector via higher education. These learners should be directed to the two-year BTEC National Extended Diploma as the most suitable qualification.

As a centre, you may want to teach learners who are taking different qualifications together. You may also wish to transfer learners between programmes to meet changes in their progression needs. You should check the qualification structures and unit combinations carefully as there is no exact match among the different sizes. You may find that learners need to complete more than the minimum number of units when transferring.

When learners are recruited, you need to give them accurate information on the title and focus of the qualification for which they are studying.

Is there a learner entry requirement?

As a centre it is your responsibility to ensure that learners who are recruited have a reasonable expectation of success on the programme. There are no formal entry requirements but we expect learners to have qualifications at or equivalent to Level 2.

Learners are most likely to succeed if they have:

- five GCSEs at good grades and/or
- BTEC qualification(s) at Level 2
- achievement in English and mathematics through GCSE or Functional Skills.

Learners may demonstrate ability to succeed in various ways. For example, learners may have relevant work experience or specific aptitude shown through diagnostic tests or non-educational experience.

What is involved in becoming an approved centre?

All centres must be approved before they can offer these qualifications – so that they are ready to assess learners and so that we can provide the support that is needed. Further information is given in *Section 8*.

What level of sector knowledge is needed to teach these qualifications?

We do not set any requirements for teachers but recommend that centres assess the overall skills and knowledge of the teaching team to ensure that they are relevant and up to date. This will give learners a rich programme to prepare them for employment in the sector.

What resources are required to deliver these qualifications?

As part of your centre approval you will need to show that the necessary material resources and work spaces are available to deliver BTEC Nationals. For some units, specific resources are required. This is indicated in the units.

How can myBTEC help with planning for these qualifications?

myBTEC is an online toolkit that supports the delivery, assessment and quality assurance of BTECs in centres. It supports teachers with activities, such as choosing a valid combination of units, creating assignment briefs and creating assessment plans. For further information see *Section 10*.

Which modes of delivery can be used for these qualifications?

You are free to deliver BTEC Nationals using any form of delivery that meets the needs of your learners. We recommend making use of a wide variety of modes, including direct instruction in classrooms or work environments, investigative and practical work, group and peer work, private study and e-learning.

What are the recommendations for employer involvement?

BTEC Nationals are vocational qualifications and, as an approved centre, you are encouraged to work with employers on the design, delivery and assessment of the course to ensure that learners have a programme of study that is engaging and relevant and that equips them for progression. There are suggestions in many of the units about how employers could become involved in delivery and/or assessment but these are not intended to be exhaustive and there will be other possibilities at local level.

What support is available?

We provide a wealth of support materials, including curriculum plans, delivery guides, authorised assignment briefs, additional papers for external assessments and examples of marked learner work.

You will be allocated a Standards Verifier early on in the planning stage to support you with planning your assessments. There will be extensive training programmes as well as support from our Subject Advisor team.

For further details see *Section 10*.

How will my learners become more employable through these qualifications?

All BTEC Nationals are mapped to relevant occupational standards (see *Appendix 1*).

Employability skills, such as team working and entrepreneurialism, and practical hands-on skills have been built into the design of the learning aims and content. This gives you the opportunity to use relevant contexts, scenarios and materials to enable learners to develop a portfolio of evidence that demonstrates the breadth of their skills and knowledge in a way that equips them for employment.

5 Assessment structure and external assessment

Introduction

BTEC Nationals are assessed using a combination of *internal assessments*, which are set and marked by teachers, and *external assessments* which are set and marked by Pearson:

- mandatory units have a combination of internal and external assessments
- all optional units are internally assessed.

We have taken great care to ensure that the assessment method chosen is appropriate to the content of the unit and in line with requirements from employers and higher education.

In developing an overall plan for delivery and assessment for the programme, you will need to consider the order in which you deliver units, whether delivery is over short or long periods and when assessment can take place. Some units are defined as synoptic units (see *Section 2*). Normally, a synoptic assessment is one that a learner would take later in a programme and in which they will be expected to apply learning from a range of units. Synoptic units may be internally or externally assessed. Where a unit is externally assessed you should refer to the sample assessment materials (SAMs) to identify where there is an expectation that learners draw on their wider learning. For internally-assessed units, you must plan the assignments so that learners can demonstrate learning from across their programme. A unit may be synoptic in one qualification and not another because of the relationship it has to the rest of the qualification.

We have addressed the need to ensure that the time allocated to final assessment of internal and external units is reasonable so that there is sufficient time for teaching and learning, formative assessment and development of transferable skills.

In administering internal and external assessment, the centre needs to be aware of the specific procedures and policies that apply, for example to registration, entries and results. An overview with signposting to relevant documents is given in *Section 7*.

Internal assessment

Our approach to internal assessment for these qualifications will be broadly familiar to experienced centres. It offers flexibility in how and when you assess learners, provided that you meet assessment and quality assurance requirements. You will need to take account of the requirements of the unit format, which we explain in *Section 3*, and the requirements for delivering assessment given in *Section 6*.

External assessment

A summary of the external assessment for this qualification is given in *Section 2*. You should check this information carefully, together with the unit specification and the sample assessment materials, so that you can timetable learning and assessment periods appropriately.

Learners must be prepared for external assessment by the time they undertake it. In preparing learners for assessment you will want to take account of required learning time, the relationship with other external assessments and opportunities for retaking. You should ensure that learners are not entered for unreasonable amounts of external assessment in one session. Learners may resit an external assessment to obtain a higher grade of near pass or above. If a learner has more than one attempt, then the best result will be used for qualification grading, up to the permitted maximum. It is unlikely that learners will need to or benefit from taking all assessments twice so you are advised to plan appropriately. Some assessments are synoptic and learners are likely to perform best if these assessments are taken towards the end of the programme.

Key features of external assessment in computing

In computing, after consultation with stakeholders, we have developed the following.

- *Unit 2: Fundamentals of Computer Systems* is a scenario-based assessment. Learners will respond to a range of short- and extended questions in four set tasks to show their knowledge and understanding of the relationship between hardware and software as part of a computer system. This unit includes the way in which computer components work, both individually and together, to store and process data, and the way in which data is transmitted and used in computer systems. It also examines the impact that computing systems have on organisations and individuals.

Units

The externally-assessed units have a specific format which we explain in *Section 3*. The content of units will be sampled across external assessments over time through appropriate papers and tasks. The ways in which learners are assessed are shown through the assessment outcomes and grading descriptors. External assessments are marked and awarded using the grade descriptors. The grades available are Distinction (D), Merit (M), Pass (P) and Near Pass (N). The Near Pass (N) grade gives learners credit below a Pass, where they have demonstrated evidence of positive performance which is worth more than an unclassified result but not yet at the Pass standard.

Sample assessment materials

Each externally-assessed unit has a set of sample assessment materials (SAMs) that accompanies this specification. The SAMs are there to give you an example of what the external assessment will look like in terms of the feel and level of demand of the assessment. In the case of units containing synoptic assessment, the SAMs will also show where learners are expected to select and apply from across the programme.

The SAMs show the range of possible question types that may appear in the actual assessments and give you a good indication of how the assessments will be structured. While SAMs can be used for practice with learners, as with any assessment the content covered and specific details of the questions asked will change in each assessment.

A copy of each of these assessments can be downloaded from our website. An additional sample of each of the Pearson-set units will be available before the first sitting of the assessment to allow your learners further opportunities for practice.

6 Internal assessment

This section gives an overview of the key features of internal assessment and how you, as an approved centre, can offer it effectively. The full requirements and operational information are given in the *Pearson Quality Assurance Handbook*. All members of the assessment team need to refer to this document.

For BTEC Nationals it is important that you can meet the expectations of stakeholders and the needs of learners by providing a programme that is practical and applied. Centres can tailor programmes to meet local needs and use links with local employers and the wider vocational sector.

When internal assessment is operated effectively it is challenging, engaging, practical and up to date. It must also be fair to all learners and meet national standards.

Principles of internal assessment

Assessment through assignments

For internally-assessed units, the format of assessment is an assignment taken after the content of the unit, or part of the unit if several assignments are used, has been delivered. An assignment may take a variety of forms, including practical and written types. An assignment is a distinct activity completed independently by learners that is separate from teaching, practice, exploration and other activities that learners complete with direction from, and formative assessment by, teachers.

An assignment is issued to learners as an assignment brief with a defined start date, a completion date and clear requirements for the evidence that they need to provide. There may be specific observed practical components during the assignment period. Assignments can be divided into tasks and may require several forms of evidence. A valid assignment will enable a clear and formal assessment outcome based on the assessment criteria.

Assessment decisions through applying unit-based criteria

Assessment decisions for BTEC Nationals are based on the specific criteria given in each unit and set at each grade level. To ensure that standards are consistent in the qualification and across the suite as a whole, the criteria for each unit have been defined according to a framework. The way in which individual units are written provides a balance of assessment of understanding, practical skills and vocational attributes appropriate to the purpose of qualifications.

The assessment criteria for a unit are hierarchical and holistic. For example, if an M criterion requires the learner to show 'analysis' and the related P criterion requires the learner to 'explain', then to satisfy the M criterion a learner will need to cover both 'explain' and 'analyse'. The unit assessment grid shows the relationships among the criteria so that assessors can apply all the criteria to the learner's evidence at the same time. In *Appendix 2* we have set out a definition of terms that assessors need to understand.

Assessors must show how they have reached their decisions using the criteria in the assessment records. When a learner has completed all the assessment for a unit then the assessment team will give a grade for the unit. This is given simply according to the highest level for which the learner is judged to have met all the criteria. Therefore:

- to achieve a Distinction, a learner must have satisfied all the Distinction criteria (and therefore the Pass and Merit criteria); these define outstanding performance across the unit as a whole
- to achieve a Merit, a learner must have satisfied all the Merit criteria (and therefore the Pass criteria) through high performance in each learning aim
- to achieve a Pass, a learner must have satisfied all the Pass criteria for the learning aims, showing coverage of the unit content and therefore attainment at Level 3 of the national framework.

The award of a Pass is a defined level of performance and cannot be given solely on the basis of a learner completing assignments. Learners who do not satisfy the Pass criteria should be reported as Unclassified.

The assessment team

It is important that there is an effective team for internal assessment. There are three key roles involved in implementing assessment processes in your centre, each with different interrelated responsibilities, the roles are listed below. Full information is given in the *Pearson Quality Assurance Handbook*.

- The Lead Internal Verifier (the Lead IV) has overall responsibility for the programme, its assessment and internal verification to meet our requirements, record keeping and liaison with the Standards Verifier. The Lead IV registers with Pearson annually. The Lead IV acts as an assessor, supports the rest of the assessment team, makes sure that they have the information they need about our assessment requirements and organises training, making use of our guidance and support materials.
- Internal Verifiers (IVs) oversee all assessment activity in consultation with the Lead IV. They check that assignments and assessment decisions are valid and that they meet our requirements. IVs will be standardised by working with the Lead IV. Normally, IVs are also assessors but they do not verify their own assessments.
- Assessors set or use assignments to assess learners to national standards. Before taking any assessment decisions, assessors participate in standardisation activities led by the Lead IV. They work with the Lead IV and IVs to ensure that the assessment is planned and carried out in line with our requirements.

Effective organisation

Internal assessment needs to be well organised so that the progress of learners can be tracked and so that we can monitor that assessment is being carried out in line with national standards. We support you through, for example, providing training materials and sample documentation. Our online myBTEC service can help support you in planning and record keeping. Further information on using myBTEC can be found in *Section 10* and on our website.

It is particularly important that you manage the overall assignment programme and deadlines to make sure that learners are able to complete assignments on time.

Learner preparation

To ensure that you provide effective assessment for your learners, you need to make sure that they understand their responsibilities for assessment and the centre's arrangements.

From induction onwards, you will want to ensure that learners are motivated to work consistently and independently to achieve the requirements of the qualifications. Learners need to understand how assignments are used, the importance of meeting assignment deadlines, and that all the work submitted for assessment must be their own.

You will need to give learners a guide that explains how assignments are used for assessment, how assignments relate to the teaching programme, and how learners should use and reference source materials, including what would constitute plagiarism. The guide should also set out your approach to operating assessment, such as how learners must submit work and request extensions.

Setting effective assignments

Setting the number and structure of assignments

In setting your assignments, you need to work with the structure of assignments shown in the *Essential information for assignments* section of a unit. This shows the structure of the learning aims and criteria that you must follow and the recommended number of assignments that you should use. For some units we provide authorised assignment briefs, for all the units we give you suggestions on how to create suitable assignments. You can find these materials along with this specification on our website. In designing your own assignment briefs you should bear in mind the following points.

- The number of assignments for a unit must not exceed the number shown in *Essential information for assignments*. However, you may choose to combine assignments, for example to create a single assignment for the whole unit.
- You may also choose to combine all or parts of different units into single assignments, provided that all units and all their associated learning aims are fully addressed in the programme overall. If you choose to take this approach, you need to make sure that learners are fully prepared so that they can provide all the required evidence for assessment and that you are able to track achievement in the records.
- A learning aim must always be assessed as a whole and must not be split into two or more tasks.
- The assignment must be targeted to the learning aims but the learning aims and their associated criteria are not tasks in themselves. Criteria are expressed in terms of the outcome shown in the evidence.
- You do not have to follow the order of the learning aims of a unit in setting assignments but later learning aims often require learners to apply the content of earlier learning aims and they may require learners to draw their learning together.
- Assignments must be structured to allow learners to demonstrate the full range of achievement at all grade levels. Learners need to be treated fairly by being given the opportunity to achieve a higher grade if they have the ability.
- As assignments provide a final assessment, they will draw on the specified range of teaching content for the learning aims. The specified content is compulsory. The evidence for assessment need not cover every aspect of the teaching content as learners will normally be given particular examples, case studies or contexts in their assignments. For example, if a learner is carrying out one practical performance, or an investigation of one organisation, then they will address all the relevant range of content that applies in that instance.

Providing an assignment brief

A good assignment brief is one that, through providing challenging and realistic tasks, motivates learners to provide appropriate evidence of what they have learned.

An assignment brief should have:

- a vocational scenario, this could be a simple situation or a full, detailed set of vocational requirements that motivates the learner to apply their learning through the assignment
- clear instructions to the learner about what they are required to do, normally set out through a series of tasks
- an audience or purpose for which the evidence is being provided
- an explanation of how the assignment relates to the unit(s) being assessed.

Forms of evidence

BTEC Nationals have always allowed for a variety of forms of evidence to be used, provided that they are suited to the type of learning aim being assessed. For many units, the practical demonstration of skills is necessary and for others, learners will need to carry out their own research and analysis. The units give you information on what would be suitable forms of evidence to provide learners with the opportunity to apply a range of employability or transferable skills. Centres may choose to use different suitable forms for evidence to those proposed. Overall, learners should be assessed using varied forms of evidence.

Full definitions of types of assessment are given in *Appendix 2*. These are some of the main types of assessment:

- written reports
- projects
- time-constrained practical assessments with observation records and supporting evidence
- recordings of performance
- sketchbooks, working logbooks, reflective journals
- presentations with assessor questioning.

The form(s) of evidence selected must:

- allow the learner to provide all the evidence required for the learning aim(s) and the associated assessment criteria at all grade levels
- allow the learner to produce evidence that is their own independent work
- allow a verifier to independently reassess the learner to check the assessor's decisions.

For example, when you are using performance evidence, you need to think about how supporting evidence can be captured through recordings, photographs or task sheets.

Centres need to take particular care that learners are enabled to produce independent work.

For example, if learners are asked to use real examples, then best practice would be to encourage them to use their own or to give the group a number of examples that can be used in varied combinations.

Making valid assessment decisions

Authenticity of learner work

Once an assessment has begun, learners must not be given feedback on progress towards fulfilling the targeted criteria.

An assessor must assess only learner work that is authentic, i.e. learners' own independent work. Learners must authenticate the evidence that they provide for assessment through signing a declaration stating that it is their own work.

Assessors must ensure that evidence is authentic to a learner through setting valid assignments and supervising them during the assessment period. Assessors must take care not to provide direct input, instructions or specific feedback that may compromise authenticity.

Assessors must complete a declaration that:

- the evidence submitted for this assignment is the learner's own
- the learner has clearly referenced any sources used in the work
- they understand that false declaration is a form of malpractice.

Centres can use Pearson templates or their own templates to document authentication.

During assessment, an assessor may suspect that some or all of the evidence from a learner is not authentic. The assessor must then take appropriate action using the centre's policies for malpractice. Further information is given in *Section 7*.

Making assessment decisions using criteria

Assessors make judgements using the criteria. The evidence from a learner can be judged using all the relevant criteria at the same time. The assessor needs to make a judgement against each criterion that evidence is present and sufficiently comprehensive. For example, the inclusion of a concluding section may be insufficient to satisfy a criterion requiring 'evaluation'.

Assessors should use the following information and support in reaching assessment decisions:

- the *Essential information for assessment decisions* section in each unit gives examples and definitions related to terms used in the criteria
- the explanation of key terms in *Appendix 2*
- examples of assessed work provided by Pearson
- your Lead IV and assessment team's collective experience, supported by the standardisation materials we provide.

Pass and Merit criteria relate to individual learning aims. The Distinction criteria as a whole relate to outstanding performance across the unit. Therefore, criteria may relate to more than one learning aim (for example A.D1) or to several learning aims (for example DE.D3). Distinction criteria make sure that learners have shown that they can perform consistently at an outstanding level across the unit and/or that they are able to draw learning together across learning aims.

Dealing with late completion of assignments

Learners must have a clear understanding of the centre policy on completing assignments by the deadlines that you give them. Learners may be given authorised extensions for legitimate reasons, such as illness at the time of submission, in line with your centre policies.

For assessment to be fair, it is important that learners are all assessed in the same way and that some learners are not advantaged by having additional time or the opportunity to learn from others. Therefore, learners who do not complete assignments by your planned deadline or the authorised extension deadline may not have the opportunity to subsequently resubmit.

If you accept a late completion by a learner, then the assignment should be assessed normally when it is submitted using the relevant assessment criteria.

Issuing assessment decisions and feedback

Once the assessment team has completed the assessment process for an assignment, the outcome is a formal assessment decision. This is recorded formally and reported to learners.

The information given to the learner:

- must show the formal decision and how it has been reached, indicating how or where criteria have been met
- may show why attainment against criteria has not been demonstrated
- must not provide feedback on how to improve evidence
- must be validated by an IV before it is given to the learner.

Resubmission of improved evidence

An assignment provides the final assessment for the relevant learning aims and is normally a final assessment decision, except where the Lead IV approves one opportunity to resubmit improved evidence based on the completed assignment brief.

The Lead IV has the responsibility to make sure that resubmission is operated fairly. This means:

- checking that a learner can be reasonably expected to perform better through a second submission, for example that the learner has not performed as expected
- making sure that giving a further opportunity can be done in such a way that it does not give an unfair advantage over other learners, for example through the opportunity to take account of feedback given to other learners
- checking that the assessor considers that the learner will be able to provide improved evidence without further guidance and that the original evidence submitted remains valid.

Once an assessment decision has been given to the learner, the resubmission opportunity must have a deadline within 15 working days in the same academic year.

A resubmission opportunity must not be provided where learners:

- have not completed the assignment by the deadline without the centre's agreement
- have submitted work that is not authentic.

Retake of internal assessment

A learner who has not achieved the level of performance required to pass the relevant learning aims after resubmission of an assignment may be offered a single retake opportunity using a new assignment. The retake may only be achieved at a pass.

The Lead Internal Verifier must only authorise a retake of an assignment in exceptional circumstances where they believe it is necessary, appropriate and fair to do so. For further information on offering a retake opportunity, you should refer to the *BTEC Centre Guide to Assessment*. We provide information on writing assignments for retakes on our website (www.btec.co.uk/keydocuments).

Planning and record keeping

For internal processes to be effective, an assessment team needs to be well organised and keep effective records. The centre will also work closely with us so that we can quality assure that national standards are being satisfied. This process gives stakeholders confidence in the assessment approach.

The Lead IV must have an assessment plan, produced as a spreadsheet or using myBTEC. When producing a plan, the assessment team may wish to consider:

- the time required for training and standardisation of the assessment team
- the time available to undertake teaching and carry out assessment, taking account of when learners may complete external assessments and when quality assurance will take place
- the completion dates for different assignments
- who is acting as IV for each assignment and the date by which the assignment needs to be verified
- setting an approach to sampling assessor decisions through internal verification that covers all assignments, assessors and a range of learners
- how to manage the assessment and verification of learners' work so that they can be given formal decisions promptly
- how resubmission opportunities can be scheduled.

The Lead IV will also maintain records of assessment undertaken. The key records are:

- verification of assignment briefs
- learner authentication declarations
- assessor decisions on assignments, with feedback given to learners
- verification of assessment decisions.

Examples of records and further information are given in the *Pearson Quality Assurance Handbook*.

7 Administrative arrangements

Introduction

This section focuses on the administrative requirements for delivering a BTEC qualification. It will be of value to Quality Nominees, Lead IVs, Programme Leaders and Examinations Officers.

Learner registration and entry

Shortly after learners start the programme of learning, you need to make sure that they are registered for the qualification and that appropriate arrangements are made for internal and external assessment. You need to refer to the *Information Manual* for information on making registrations for the qualification and entries for external assessments.

Learners can be formally assessed only for a qualification on which they are registered. If learners' intended qualifications change, for example if a learner decides to choose a different pathway specialism, then the centre must transfer the learner appropriately.

Access to assessment

Both internal and external assessments need to be administered carefully to ensure that all learners are treated fairly, and that results and certification are issued on time to allow learners to progress to chosen progression opportunities.

Our equality policy requires that all learners should have equal opportunity to access our qualifications and assessments, and that our qualifications are awarded in a way that is fair to every learner. We are committed to making sure that:

- learners with a protected characteristic are not, when they are undertaking one of our qualifications, disadvantaged in comparison to learners who do not share that characteristic
- all learners achieve the recognition they deserve for undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

Further information on access arrangements can be found in the Joint Council for Qualifications (JCQ) document *Access Arrangements, Reasonable Adjustments and Special Consideration for General and Vocational Qualifications*.

Administrative arrangements for internal assessment

Records

You are required to retain records of assessment for each learner. Records should include assessments taken, decisions reached and any adjustments or appeals. Further information can be found in the *Information Manual*. We may ask to audit your records so they must be retained as specified.

Reasonable adjustments to assessment

A reasonable adjustment is one that is made before a learner takes an assessment to ensure that they have fair access to demonstrate the requirements of the assessments. You are able to make adjustments to internal assessments to take account of the needs of individual learners. In most cases this can be achieved through a defined time extension or by adjusting the format of evidence. We can advise you if you are uncertain as to whether an adjustment is fair and reasonable. You need to plan for time to make adjustments if necessary.

Further details on how to make adjustments for learners with protected characteristics are given on our website in the document *Supplementary guidance for reasonable adjustment and special consideration in vocational internally-assessed units*.

Special consideration

Special consideration is given after an assessment has taken place for learners who have been affected by adverse circumstances, such as illness. You must operate special consideration in line with our policy (see previous paragraph). You can provide special consideration related to the period of time given for evidence to be provided or for the format of the assessment if it is equally valid. You may not substitute alternative forms of evidence to that required in a unit, or omit the application of any assessment criteria to judge attainment. Pearson can consider applications for special consideration in line with the policy.

Appeals against assessment

Your centre must have a policy for dealing with appeals from learners. These appeals may relate to assessment decisions being incorrect or assessment not being conducted fairly. The first step in such a policy could be a consideration of the evidence by a Lead IV or other member of the programme team. The assessment plan should allow time for potential appeals after assessment decisions have been given to learners. If there is an appeal by a learner, you must document the appeal and its resolution. Learners have a final right of appeal to Pearson but only if the procedures that you have put in place have not been followed. Further details are given in the document *Enquiries and appeals about Pearson vocational qualifications and end point assessment policy*.

Administrative arrangements for external assessment

Entries and resits

For information on the timing of assessment and entries, please refer to the annual examinations timetable on our website.

Access arrangements requests

Access arrangements are agreed with Pearson before an assessment. They allow students with special educational needs, disabilities or temporary injuries to:

- access the assessment
- show what they know and can do without changing the demands of the assessment.

Access arrangements should always be processed at the time of registration. Learners will then know what type of arrangements are available in place for them.

Granting reasonable adjustments

For external assessment, a reasonable adjustment is one that we agree to make for an individual learner. A reasonable adjustment is defined for the individual learner and informed by the list of available access arrangements.

Whether an adjustment will be considered reasonable will depend on a number of factors, to include:

- the needs of the learner with the disability
- the effectiveness of the adjustment
- the cost of the adjustment; and
- the likely impact of the adjustment on the learner with the disability and other learners.

Adjustment may be judged unreasonable and not approved if it involves unreasonable costs, timeframes or affects the integrity of the assessment.

Special consideration requests

Special consideration is an adjustment made to a student's mark or grade after an external assessment to reflect temporary injury, illness or other indisposition at the time of the assessment. An adjustment is made only if the impact on the learner is such that it is reasonably likely to have had a material effect on that learner being able to demonstrate attainment in the assessment.

Centres are required to notify us promptly of any learners who they believe have been adversely affected and request that we give special consideration. Further information can be found in the special requirements section on our website.

Conducting external assessments

Centres must make arrangements for the secure delivery of external assessments. External assessments for BTEC qualifications include examinations, set tasks and performance.

Each external assessment has a defined degree of control under which it must take place. Some external assessments may have more than one part and each part may have a different degree of control. We define degrees of control as follows.

High control

This is the completion of assessment in formal invigilated examination conditions.

Medium control

This is completion of assessment, usually over a longer period of time, which may include a period of controlled conditions. The controlled conditions may allow learners to access resources, prepared notes or the internet to help them complete the task.

Low control

These are activities completed without direct supervision. They may include research, preparation of materials and practice. The materials produced by learners under low control will not be directly assessed.

Further information on responsibilities for conducting external assessment is given in the document *Instructions for Conducting External Assessments*, available on our website.

Dealing with malpractice in assessment

Malpractice means acts that undermine the integrity and validity of assessment, the certification of qualifications, and/or that may damage the authority of those responsible for delivering the assessment and certification.

Pearson does not tolerate actions (or attempted actions) of malpractice by learners, centre staff or centres in connection with Pearson qualifications. Pearson may impose penalties and/or sanctions on learners, centre staff or centres where incidents (or attempted incidents) of malpractice have been proven.

Malpractice may arise or be suspected in relation to any unit or type of assessment within the qualification. For further details regarding malpractice and advice on preventing malpractice by learners please see Pearson's *Centre guidance: Dealing with malpractice and maladministration in vocational qualifications*, available on our website.

The procedures we ask you to adopt vary between units that are internally-assessed and those that are externally assessed.

Internally-assessed units

Centres are required to take steps to prevent malpractice and to investigate instances of suspected malpractice. Learners must be given information that explains what malpractice is for internal assessment and how suspected incidents will be dealt with by the centre. The *Centre Guidance: Dealing with Malpractice* document gives full information on the actions we expect you to take.

Pearson may conduct investigations if we believe that a centre is failing to conduct internal assessment according to our policies. The above document gives further information, examples and details the penalties and sanctions that may be imposed.

In the interests of learners and centre staff, centres need to respond effectively and openly to all requests relating to an investigation into an incident of suspected malpractice.

Externally-assessed units

External assessment means all aspects of units that are designated as external in this specification, including preparation for tasks and performance. For these assessments centres must follow the JCQ procedures set out in the latest version of *JCQ Suspected Malpractice in Examinations and Assessments Policies and Procedures* (www.jcq.org.uk).

In the interests of learners and centre staff, centres need to respond effectively and openly to all requests relating to an investigation into an incident of suspected malpractice.

Learner malpractice

Heads of Centres are required to report incidents of any suspected learner malpractice that occur during Pearson external assessments. We ask that centres do so by completing a *JCQ Form M1* (available at www.jcq.org.uk/exams-office/malpractice) and emailing it and any accompanying documents (signed statements from the learner, invigilator, copies of evidence, etc.) to the Investigations Team at candidatemalpractice@pearson.com. The responsibility for determining appropriate sanctions or penalties to be imposed on learners lies with Pearson.

Learners must be informed at the earliest opportunity of the specific allegation and the centre's malpractice policy, including the right of appeal. Learners found guilty of malpractice may be disqualified from the qualification for which they have been entered with Pearson.

Teacher/centre malpractice

Heads of Centres are required to inform Pearson's Investigations Team of any incident of suspected malpractice by centre staff, before any investigation is undertaken. Heads of centres are requested to inform the Investigations Team by submitting a *JCQ Form M2(a)* (available at www.jcq.org.uk/exams-office/malpractice) with supporting documentation to pqsmalpractice@pearson.com. Where Pearson receives allegations of malpractice from other sources (for example Pearson staff or anonymous informants), the Investigations Team will conduct the investigation directly or may ask the head of centre to assist.

Incidents of maladministration (accidental errors in the delivery of Pearson qualifications that may affect the assessment of learners) should also be reported to the Investigations Team using the same method.

Heads of Centres/Principals/Chief Executive Officers or their nominees are required to inform learners and centre staff suspected of malpractice of their responsibilities and rights; see Section 6.15 of the *JCQ Suspected Malpractice in Examinations and Assessments Policies and Procedures* document.

Pearson reserves the right in cases of suspected malpractice to withhold the issuing of results and/or certificates while an investigation is in progress. Depending on the outcome of the investigation results and/or certificates may be released or withheld.

You should be aware that Pearson may need to suspend certification when undertaking investigations, audits and quality assurances processes. You will be notified within a reasonable period of time if this occurs.

Sanctions and appeals

Where malpractice is proven we may impose sanctions or penalties.

Where learner malpractice is evidenced, penalties may be imposed such as:

- mark reduction for external assessments
- disqualification from the qualification
- being barred from registration for Pearson qualifications for a period of time.

If we are concerned about your centre's quality procedures we may impose sanctions such as:

- working with you to create an improvement action plan
- requiring staff members to receive further training
- placing temporary blocks on your certificates
- placing temporary blocks on registration of learners
- debarring staff members or the centre from delivering Pearson qualifications
- suspending or withdrawing centre approval status.

The centre will be notified if any of these apply.

Pearson has established procedures for centres that are considering appeals against penalties and sanctions arising from malpractice. Appeals against a decision made by Pearson will normally be accepted only from Heads of Centres (on behalf of learners and/or members of staff) and from individual members (in respect of a decision taken against them personally). Further information on appeals can be found in our *Enquiries and appeals about Pearson vocational qualifications and end point assessment policy*, which is on our website. In the initial stage of any aspect of malpractice, please notify the Investigations Team by email via pqsmalpractice@pearson.com who will inform you of the next steps.

Certification and results

Once a learner has completed all the required components for a qualification, even if final results for external assessments have not been issued, then the centre can claim certification for the learner, provided that quality assurance has been successfully completed. For the relevant procedures please refer to our *Information Manual*. You can use the information provided on qualification grading to check overall qualification grades.

Results issue

After the external assessment session, learner results will be issued to centres. The result will be in the form of a grade. You should be prepared to discuss performance with learners, making use of the information we provide and post-results services.

Post-assessment services

Once results for external assessments are issued, you may find that the learner has failed to achieve the qualification or to attain an anticipated grade. It is possible to transfer or reopen registration in some circumstances. The *Information Manual* gives further information.

Changes to qualification requests

Where a learner who has taken a qualification wants to resit an externally-assessed unit to improve their qualification grade, you firstly need to decline their overall qualification grade. You may decline the grade before the certificate is issued. For a learner receiving their results in August, you should decline the grade by the end of September if the learner intends to resit an external assessment.

Additional documents to support centre administration

As an approved centre you must ensure that all staff delivering, assessing and administering the qualifications have access to this documentation. These documents are reviewed annually and are reissued if updates are required.

- *Pearson Quality Assurance Handbook*: this sets out how we will carry out quality assurance of standards and how you need to work with us to achieve successful outcomes.
- *Information Manual*: this gives procedures for registering learners for qualifications, transferring registrations, entering for external assessments and claiming certificates.
- *Lead Examiners' Reports*: these are produced after each series for each external assessment and give feedback on the overall performance of learners in response to tasks or questions set.
- *Instructions for the Conduct of External Assessments (ICEA)*: this explains our requirements for the effective administration of external assessments, such as invigilation and submission of materials.
- *Regulatory policies*: our regulatory policies are integral to our approach and explain how we meet internal and regulatory requirements. We review the regulated policies annually to ensure that they remain fit for purpose. Policies related to this qualification include:
 - adjustments for candidates with disabilities and learning difficulties, access arrangements and reasonable adjustments for general and vocational qualifications
 - age of learners
 - centre guidance for dealing with malpractice
 - recognition of prior learning and process.

This list is not exhaustive and a full list of our regulatory policies can be found on our website.

8 Quality assurance

Centre and qualification approval

As part of the approval process, your centre must make sure that the resource requirements listed below are in place before offering the qualification.

- Centres must have appropriate physical resources (for example, equipment, IT, learning materials, teaching rooms) to support the delivery and assessment of the qualification.
- Staff involved in the assessment process must have relevant expertise and/or occupational experience.
- There must be systems in place to ensure continuing professional development for staff delivering the qualification.
- Centres must have in place appropriate health and safety policies relating to the use of equipment by learners.
- Centres must deliver the qualification in accordance with current equality legislation.
- Centres should refer to the teacher guidance section in individual units to check for any specific resources required.

Continuing quality assurance and standards verification

On an annual basis, we produce the *Pearson Quality Assurance Handbook*. It contains detailed guidance on the quality processes required to underpin robust assessment and internal verification.

The key principles of quality assurance are that:

- a centre delivering BTEC programmes must be an approved centre, and must have approval for the programmes or groups of programmes that it is delivering
- the centre agrees, as part of gaining approval, to abide by specific terms and conditions around the effective delivery and quality assurance of assessment; it must abide by these conditions throughout the period of delivery
- Pearson makes available to approved centres a range of materials and opportunities, through online standardisation, intended to exemplify the processes required for effective assessment, and examples of effective standards. Approved centres must use the materials and services to ensure that all staff delivering BTEC qualifications keep up to date with the guidance on assessment
- an approved centre must follow agreed protocols for standardisation of assessors and verifiers, for the planning, monitoring and recording of assessment processes, and for dealing with special circumstances, appeals and malpractice.

The approach of quality-assured assessment is through a partnership between an approved centre and Pearson. We will make sure that each centre follows best practice and employs appropriate technology to support quality-assurance processes, where practicable. We work to support centres and seek to make sure that our quality-assurance processes do not place undue bureaucratic processes on centres. We monitor and support centres in the effective operation of assessment and quality assurance.

The methods we use to do this for BTEC Level 3 include:

- making sure that all centres complete appropriate declarations at the time of approval
- undertaking approval visits to centres
- making sure that centres have effective teams of assessors and verifiers who are trained to undertake assessment
- assessment sampling and verification, through requested samples of assessments, completed assessed learner work and associated documentation
- an overarching review and assessment of a centre's strategy for delivering and quality assuring its BTEC programmes, for example making sure that synoptic units are placed appropriately in the order of delivery of the programme.

Centres that do not fully address and maintain rigorous approaches to delivering, assessing and quality assurance cannot seek certification for individual programmes or for all BTEC Level 3 programmes. An approved centre must make certification claims only when authorised by us and strictly in accordance with requirements for reporting.

Centres that do not comply with remedial action plans may have their approval to deliver qualifications removed.

9 Understanding the qualification grade

Awarding and reporting for the qualification

This section explains the rules that we apply in awarding a qualification and in providing an overall qualification grade for each learner. It shows how all the qualifications in this sector are graded.

The awarding and certification of these qualifications will comply with regulatory requirements.

Eligibility for an award

In order to be awarded a qualification, a learner must complete all units, achieve a Near Pass (N) or above in all external units and a pass or above in all mandatory units unless otherwise specified. Refer to the structure in *Section 2*.

To achieve any qualification grade, learners must:

- complete and **have an outcome** (D, M, P, N or U) for all units within a valid combination
- achieve the **required units at Pass or above** shown in *Section 2*, and for the Extended Diploma achieve a minimum 900 GLH at Pass or above (or N or above in external units)
- achieve the **minimum number of points** at a grade threshold.

It is the responsibility of a centre to ensure that a correct unit combination is adhered to. Learners who do not achieve the required minimum grade (N or P) in units shown in the structure will not achieve a qualification.

Learners who do not achieve sufficient points for a qualification or who do not achieve all the required units may be eligible to achieve a smaller qualification in the same suite provided they have completed and achieved the correct combination of units and met the appropriate qualification grade points threshold.

Calculation of the qualification grade

The final grade awarded for a qualification represents an aggregation of a learner's performance across the qualification. As the qualification grade is an aggregate of the total performance, there is some element of compensation in that a higher performance in some units may be balanced by a lower outcome in others.

In the event that a learner achieves more than the required number of optional units, the mandatory units along with the optional units with the highest grades will be used to calculate the overall result, subject to the eligibility requirements for that particular qualification title.

BTEC Nationals are Level 3 qualifications and are awarded at the grade ranges shown in the table below.

Qualification	Available grade range
Certificate, Extended Certificate, Foundation Diploma	P to D*
Diploma	PP to D*D*
Extended Diploma	PPP to D*D*D*

The *Calculation of qualification grade* table, shown further on in this section, shows the minimum thresholds for calculating these grades. The table will be kept under review over the lifetime of the qualification. The most up to date table will be issued on our website.

Pearson will monitor the qualification standard and reserves the right to make appropriate adjustments.

Learners who do not meet the minimum requirements for a qualification grade to be awarded will be recorded as Unclassified (U) and will not be certificated. They may receive a Notification of Performance for individual units. The *Information Manual* gives full information.

Points available for internal units

The table below shows the number of **points** available for internal units. For each internal unit, points are allocated depending on the grade awarded.

	Unit size	
	60 GLH	90 GLH
U	0	0
Pass	6	9
Merit	10	15
Distinction	16	24

Points available for external units

Raw marks from the external units will be awarded **points** based on performance in the assessment. The table below shows the **minimum number of points** available for each grade in the external units.

	Unit size	
	90 GLH	120 GLH
U	0	0
Near Pass	6	8
Pass	9	12
Merit	15	20
Distinction	24	32

Pearson will automatically calculate the points for each external unit once the external assessment has been marked and grade boundaries have been set. For more details about how we set grade boundaries in the external assessment please go to our website.

Claiming the qualification grade

Subject to eligibility, Pearson will automatically calculate the qualification grade for your learners when the internal unit grades are submitted and the qualification claim is made. Learners will be awarded qualification grades for achieving the sufficient number of points within the ranges shown in the relevant *Calculation of qualification grade* table for the cohort.

Calculation of qualification grade

Applicable for registration from 1 September 2017.

Certificate		Extended Certificate		Foundation Diploma		Diploma		Extended Diploma	
180 GLH		360 GLH		510 GLH		720 GLH		1080 GLH	
Grade	Points threshold	Grade	Points threshold	Grade	Points threshold	Grade	Points threshold	Grade	Points threshold
U	0	U	0	U	0	U	0	U	0
Pass	18	P	36	P	51	PP	72	PPP	108
						MP	88	MPP	124
								MMP	140
Merit	26	M	52	M	73	MM	104	MMM	156
						DM	124	DMM	176
								DDM	196
Distinction	42	D	74	D	104	DD	144	DDD	216
						D*D	162	D*DD	234
								D*D*D	252
Distinction*	48	D*	90	D*	130	D*D*	180	D*D*D*	270

The table is subject to review over the lifetime of the qualification. The most up-to-date version will be issued on our website.

Examples of grade calculations based on table applicable to registrations from September 2017

Example 1: Achievement of a Certificate with a P grade

	GLH	Type (Int/Ext)	Grade	Unit points
Unit 1	90	Ext	Pass	9
Unit 7	90	Int	Merit	15
Totals	180		P	24

The learner has sufficient points for a P grade.

Example 2: Achievement of a Certificate with a M grade

	GLH	Type (Int/Ext)	Grade	Unit points
Unit 1	90	Ext	Near Pass	6
Unit 7	90	Int	Distinction	24
Totals	180		M	30

The learner has sufficient points for a M grade.

Example 3: An Unclassified result for a Certificate

	GLH	Type (Int/Ext)	Grade	Unit points
Unit 1	90	Ext	U	0
Unit 7	90	Int	Distinction	24
Totals	180		U	24

The learner has a U in Unit 1.

The learner has sufficient points for a P grade but has not met the minimum requirement for an N grade or higher in Unit 1.

10 Resources and support

Our aim is to give you a wealth of resources and support to enable you to deliver BTEC National qualifications with confidence. On our website you will find a list of resources to support teaching and learning, and professional development.

Support for setting up your course and preparing to teach

Specification

This **specification** (for teaching from September 2017) includes details on the administration of qualifications and information on all the units for the qualification.

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 Nationals (for example employer involvement and employability skills). It also covers guidance on assessment (internal and external) 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 provided for each mandatory unit. These are available in Word™ format for ease of customisation.

Curriculum models

These show how the BTECs in the suite fit into a 16–19 study programme, depending on their size and purpose. The models also show where other parts of the programme, such as work experience, maths and English, tutorial time and wider study, fit alongside the programme.

Study skills activities

A range of case studies and activities is provided; they are designed to help learners develop the study skills they need to successfully complete their BTEC course. The case studies and activities are provided in Word™ format for easy customisation.

myBTEC

myBTEC is a free, 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. We will add the new BTEC National specifications to myBTEC as soon as possible.

Support for teaching and learning

Pearson Learning Services provides a range of engaging resources to support BTEC Nationals, including:

- textbooks in e-book and print formats
- revision guides and revision workbooks in e-book 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 externally-assessed units

Sample assessments are available for the Pearson-set units. One copy of each of these assessments can be downloaded from the website/available in print. For each suite an additional sample for one of the Pearson-set units is also available, allowing your learners further opportunities for practice.

Further sample assessments will be made available through our website on an ongoing basis.

Sample assessment materials for internally-assessed units

We do not prescribe the assessments for the internally-assessed units. Rather, we allow you to set your own, according to your learners' preferences and to link with your local employment profile.

We do provide a service in the form of Authorised Assignment Briefs, which are approved by Pearson Standards Verifiers. They are available via our website or free on myBTEC.

Sample marked learner work

To support you in understanding the expectation of the standard at each grade, examples of marked learner work at PM/MD grades are linked to the Authorised Assignment Briefs.

Training and support from Pearson

People to talk to

There are many people who are available to support you and provide advice and guidance on delivery of your BTEC Nationals. These include:

- Subject Advisors – available for all sectors. They understand all Pearson qualifications in their sector and so can answer sector-specific queries on planning, teaching, learning and assessment
- Standards Verifiers – they can support you with preparing your assignments, ensuring that your assessment plan is set up correctly, and support you in preparing learner work and providing quality assurance through sampling
- Curriculum Development Managers (CDMs) – they are regionally based and have a full overview of the BTEC qualifications and of the support and resources that Pearson provides. CDMs often run network events
- Customer Services – the ‘Support for You’ section of our website gives the different ways in which you can contact us for general queries. For specific queries, our service operators can direct you to the relevant person or department.

Training and professional development

Pearson provides a range of training and professional development events to support the introduction, delivery, assessment and administration of BTEC National qualifications. These sector-specific events, developed and delivered by specialists, are available both face to face and online.

‘Getting Ready to Teach’

These events are designed to get teachers ready for delivery of the BTEC Nationals. They include an overview of the qualifications’ structures, planning and preparation for internal and external assessment, and quality assurance.

Teaching and learning

Beyond the ‘Getting Ready to Teach’ professional development events, there are opportunities for teachers to attend sector- and role-specific events. These events are designed to connect practice to theory; they provide teacher support and networking opportunities with delivery, learning and assessment methodology.

Details of our training and professional development programme can be found on our website.

Appendix 1 Links to industry standards

BTEC Nationals have been developed in consultation with industry and appropriate sector bodies to ensure that the qualification content and approach to assessment aligns closely to the needs of employers. Where they exist, and are appropriate, National Occupational Standards (NOS) and professional body standards have been used to establish unit content.

Appendix 2 Glossary of terms used for internally-assessed units

This is a summary of the key terms used to define the requirements in the units.

Term	Definition
Analyse	Learners present the outcome of methodical and detailed examination either: <ul style="list-style-type: none"> • breaking down a theme, topic or situation in order to interpret and study the interrelationships between the parts and/or • of information or data to interpret and study key trends and interrelationships.
Apply	Learners' practice evidences the ability to carry out and apply knowledge, understanding and skills in a practical situation.
Assess	Learners present a careful consideration of varied factors or events that apply to a specific situation, or identify those which are the most important or relevant and arrive at a conclusion.
Build	Learners construct (something) by putting parts of material together.
Carry out	Learners demonstrate skills through practical activities.
Compare	Learners identify the main factors relating to two or more items/situations or aspects of a subject that is extended to explain the similarities, differences, advantages and disadvantages. This is used to show depth of knowledge through selection and isolation of characteristics.
Create	Learners bring something into existence, e.g. drawings.
Define (a problem)	Learners' work, performance or practice states or describes the nature, scope or meaning of a subject as objective facts.
Demonstrate	Learners' work, performance or practice shows the ability to carry out and apply knowledge, understanding and/or skills in a practical situation.
Design	Learners apply skills and knowledge to the process of deciding on the look and functioning of a product.
Develop	Learners acquire and apply skills through practical activities.

Term	Definition
Discuss	Learners consider different aspects of: <ul style="list-style-type: none"> • a theme or topic • how they interrelate • the extent to which they are important. A conclusion is not required.
(Forensically) Document	Learners record and represent, or describe something accurately, using words or images.
Enhance	Learners enhance the efficiency of a method, system, process or product that already meets all specified safety and technical requirements.
Evaluate	Learners draw on varied information, themes or concepts to consider aspects such as: <ul style="list-style-type: none"> • strengths or weaknesses • advantages or disadvantages • alternative actions • relevance or significance. Learners' enquiries should lead to a supported judgement showing relationship to its context. This will often be in a conclusion.
Examine	Learners select and apply knowledge to less familiar contexts.
Explain	Learners' work shows clear details and gives reasons and/or evidence to support an opinion, view or argument. It could show how conclusions are drawn.
Explore	Learners apply their skills and/or knowledge in contexts involving practical testing or trialling.
Implement	Learners consider the relevant factors to put a plan into practice, requiring self-direction in the selection of factors such as planning, research, exploration, outcome and review.
Investigate	Learners' knowledge is based on personal research and development.
Justify	Learners give reasons or evidence to: <ul style="list-style-type: none"> • support an opinion • prove something right or reasonable.
Optimise	Learners improve a process or product by incremental steps to achieve the best performance possible.
Perform	Learners carry out or execute what has to be done in order to complete an identified activity or to demonstrate personal achievement.
Plan	Learners create a way of doing a task or series of tasks to achieve specific requirements or objectives, showing progress from start to finish.

Term	Definition
Produce	Learners' knowledge, understanding and/or skills are applied to develop a particular type of evidence, e.g. a plan, product or report.
Refine	Learners improve an idea, method, system, process or product by making minor changes.
Review	Learners make a formal assessment. They appraise existing information or prior events, or reconsider information with the intention of making changes if necessary.
Support	Learners select and use appropriate skills to support systems or processes in achieving set aims and meeting identified needs.
Test	Learners take measures to check the quality, performance, or reliability of something, especially before putting it into widespread use or practice.
Understand	Learners demonstrate knowledge related to defined situations.

This is a key summary of the types of evidence used for BTEC Nationals.

Type of evidence	Definition and purpose
Case study	A specific example to which all learners must select and apply knowledge. Used to show application to a realistic context where direct experience cannot be gained.
Individual project	A self-directed, large-scale activity requiring, planning, research, exploration, outcome and review. Used to show self-management, project management and/or deep learning, including synopticity.

Pearson BTEC Level 3 Nationals in Computing

Certificate in Computing

Extended Certificate in Computing

Foundation Diploma in Computing

Diploma in Computing

Extended Diploma in Computing

For more information about Edexcel, BTEC or LCCI qualifications
visit qualifications.pearson.com

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