



BTEC Nationals Specification

**Pearson BTEC Level 3 Extended Diploma in
Aircraft Maintenance**

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Issue 3

Edexcel, BTEC and LCCI qualifications

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This specification is Issue 4. Key changes are sidelined. We will inform centres of any changes to this issue. The latest issue can be found on the Edexcel website: www.edexcel.com

This specification is Issue 3. Key changes are sidelined. We will inform centres of any changes to this issue. The latest issue can be found on the Pearson website: www.pearson.com

These qualifications were previously entitled:

Edexcel BTEC Level 3, Extended Diploma in Aircraft Maintenance (QCF)

The QNs remain the same

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Contents

BTEC National qualification titles covered by this specification	1
What are BTEC Nationals?	2
Total Qualification Time	3
Pearson BTEC Level 3 Extended Diploma – 180 credits	3
Key features of the BTEC Nationals in Aircraft Maintenance	4
Rationale for the BTEC Nationals in Aircraft Maintenance	4
National Occupational Standards	5
Rules of combination for Pearson BTEC Level 3 National qualifications	6
Pearson BTEC Level 3 Extended Diploma in Aircraft Maintenance	7
Assessment and grading	8
Grading domains	8
Calculation of the qualification grade	9
Quality assurance of centres	11
Approval	11
Programme design and delivery	12
Mode of delivery	13
Resources	13
Delivery approach	13
Meeting local needs	14
Limitations on variations from standard specifications	14
Additional and specialist learning	14
Functional Skills	14
Personal, learning and thinking skills	14

Access and recruitment	15
Restrictions on learner entry	15
Access arrangements and special considerations	15
Recognition of Prior Learning	16
Unit format	16
Unit title	16
Level	16
Credit value	16
Guided learning hours	17
Aim and purpose	17
Unit introduction	17
Learning outcomes	17
Unit content	17
Assessment and grading grid	18
Essential guidance for tutors	18
Further information	19
Useful publications	19
How to obtain National Occupational Standards	19
Professional development and training	20
Annexe A	21
The Pearson BTEC qualification framework for the Engineering sector	21
Annexe B	25
Grading domains: BTEC Level 3 generic grading domains	25
Annexe C	27
Personal, learning and thinking skills	27
Annexe D	33
Wider curriculum mapping	33
Annexe E	37
National Occupational Standards/mapping with NVQs	37

Annexe F **39**

Examples of calculation of qualification grade above pass grade **39**

Points available for credits achieved at different levels and unit grades **39**

Annexe G **45**

Additional content required for full coverage of European Aviation Safety Agency (EASA) Part 66 syllabus **45**



BTEC National qualification titles covered by this specification

Pearson BTEC Level 3 Extended Diploma in Aircraft Maintenance

This qualification has been accredited to the national framework and is eligible for public funding as determined by the Department for Education (DfE) under Section 96 of the Learning and Skills Act 2000.

The qualification listed above features in the funding lists published annually by the DfE and the regularly updated website www.education.gov.uk. The Qualification Number (QN) should be used by centres when they wish to seek public funding for their learners. Each unit within a qualification will also have a unit code.

The qualification and unit codes will appear on learners' final certification documentation.

The QN for the qualification in this publication is:

Pearson BTEC Level 3 Extended Diploma in Aircraft Maintenance	500/8099/4
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This qualification title will appear on learners' certificates. Learners need to be made aware of this when they are recruited by the centre and registered with Pearson.

What are BTEC Nationals?

BTEC National qualifications are undertaken in further education and sixth-form colleges, schools and other training providers, and have been since they were introduced in 1984. Their purpose, approaches to teaching, learning and assessment are established and understood by teaching professionals, employers and learners alike.

The BTEC National qualification within this specification is:

- Pearson BTEC Level 3 Extended Diploma in Aircraft Maintenance

It maintains the same equivalences, benchmarks and other articulations (for example SCAAT points, UCAS Tariff points) as its predecessor qualification. The following identifies the titling conventions and variations between the predecessor and new specifications:

Predecessor BTEC Nationals (accredited 2007)	BTEC Nationals (for delivery from September 2010)
Not applicable	Pearson BTEC Level 3 Certificate
Edexcel Level 3 BTEC National Award	Pearson BTEC Level 3 Subsidiary Diploma
Edexcel Level 3 BTEC National Certificate	Pearson BTEC Level 3 Diploma
Edexcel Level 3 BTEC National Diploma	Pearson BTEC Level 3 Extended Diploma

BTEC Nationals are designed to provide highly specialist work-related qualifications in a range of vocational sectors. They give learners the knowledge, understanding and skills that they need to prepare for employment. The qualifications also provide career development opportunities for those already in work, and through articulation to higher education, degree and professional development programmes provide progression opportunities within the same cognate or related areas of study within universities and other institutions. BTEC Nationals accredit the achievement for courses and programmes of study for full-time or part-time learners in schools, colleges and other training provider organisations.

BTEC Nationals provide much of the underpinning knowledge and understanding for the National Occupational Standards for the sector, where these are appropriate. They are supported by the relevant Sector Skills Councils (SSCs) and/or Standards Setting Bodies (SSBs). Certain BTEC Nationals are recognised as Technical Certificates and form part of the Apprenticeship Framework. They attract UCAS points that equate to similar-sized general qualifications within education institutions within the UK.

On successful completion of a BTEC National qualification, a learner can progress to or within employment and/or continue their study in the same, or related vocational area.

Total Qualification Time

For all regulated qualifications, Pearson specifies a total number of hours that it is expected the average learner will be required to undertake in order to complete and show achievement for the qualification: this is the Total Qualification Time (TQT).

Within this, Pearson will also identify the number of Guided Learning Hours (GLH) that we expect a centre delivering the qualification will need to provide. Guided learning means activities that directly or immediately involve tutors and assessors in teaching, supervising, and invigilating learners, such as lessons, tutorials, online instruction, supervised study giving feedback on performance.

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

These qualifications also have a credit value, which is equal to one tenth of TQT. Pearson consults with users of these qualifications in assigning TQT and credit values.

This suite of BTEC Level 3 qualifications is available in the following sizes:

Extended Diploma – 1800 TQT (180 credits, 1080 GLH)

Pearson BTEC Level 3 Extended Diploma – 180 credits

The 180-credit BTEC Level 3 Extended Diploma extends and deepens the specialist work-related focus from the BTEC Level 3 Diploma. There is potential for the qualification to prepare learners for appropriate direct employment in the vocational sector and it is suitable for those who have decided that they clearly wish to enter a particular specialist area of work. It is broadly equivalent to three GCE A Levels.

Some learners may wish to gain the qualification in order to enter a specialist area of employment or to progress to a higher education foundation degree, HND or other professional development programme. Other learners may want to extend the specialist nature of the subjects they studied on the BTEC Level 3 Diploma or another programme of study.

● **Key features of the BTEC Nationals in Aircraft Maintenance**

The BTEC National in Aircraft Maintenance has been developed in the engineering sector to:

- give education and training for employees in the aircraft maintenance and aeronautical engineering industries
- give opportunities for employees in the aeronautical engineering sector to achieve a nationally recognised Level 3 vocationally-specific qualification
- give full-time learners the opportunity to enter employment in the aerospace sector or to progress to vocational qualifications such as the Pearson BTEC Higher Nationals in Aerospace Engineering
- give learners the opportunity to develop a range of skills and techniques, personal skills and attributes essential for successful performance in working life

● **Rationale for the BTEC Nationals in Aircraft Maintenance**

The BTEC National in Aircraft Maintenance has been designed to give new entrants to the aerospace sector the underpinning knowledge and specific skills needed to meet the needs of modern aircraft maintenance and aerospace industries.

The units within the Level 3 BTEC Extended Diploma in Aircraft Maintenance have been mapped against the European Aviation Safety Agency (EASA) Part 66 syllabus requirements. The qualification provides coverage of much of the underpinning knowledge needed for the EASA Part 66 syllabus. To ensure full coverage of the EASA Part 66 modules some additional content will need to be covered. This additional material is identified where appropriate in Annexe G.

National Occupational Standards

BTEC Nationals are designed to provide much of the underpinning knowledge and understanding for the National Occupational Standards (NOS), as well as developing practical skills in preparation for work and possible achievement of NVQs in due course. NOS form the basis of National Vocational Qualifications (NVQs). BTEC Nationals do not purport to deliver occupational competence in the sector, which should be demonstrated in a work context.

Each unit in the specification identifies links to elements of the NOS.

The Pearson BTEC Level 3 Nationals in Aircraft Maintenance relates to the following NOS:

- Level 3 NVQ in Aeronautical Engineering.

Rules of combination for Pearson BTEC Level 3 National qualifications

The rules of combination specify the:

- total credit value of the qualification
- the minimum credit to be achieved at the level or above the level of the qualification
- the mandatory unit credit
- the optional unit credit
- the maximum credit that can come from other level 3 BTEC units in this qualification suite.

When combining units for a BTEC National qualification, it is the centre's responsibility to ensure that the following rules of combination are adhered to.

Pearson BTEC Level 3 Extended Diploma

- 1 Qualification credit value: a minimum of 180 credits.
- 2 Minimum credit to be achieved at, or above, the level of the qualification: 135 credits.
- 3 Mandatory unit credit: 50 credits.
- 4 Optional unit credit: 130.
- 5 A maximum of 30 optional credits can come from other level 3 BTEC units to meet local needs.

Pearson BTEC Level 3 Extended Diploma in Aircraft Maintenance

The Pearson BTEC Level 3 Extended Diploma in Aircraft Maintenance is 180 credits and 1080 guided learning hours (GLH) qualification. It consists of four mandatory units plus optional units that provide for a combined total of 180 credits (where at least 135 credits must be at Level 3 or above).

Pearson BTEC Level 3 Extended Diploma in Aircraft Maintenance			
Unit	Mandatory units	Credit	Level
66	Theory of Flight	10	3
69	Aircraft Workshop Principles and Practice	15	3
70	Aircraft Materials and Hardware	15	3
77	Human Factors in Aircraft Engineering	10	3
Unit	Optional units		
6	Electrical and Electronic Principles	10	3
67	Principles and Applications of Aircraft Mechanical Science	10	3
68	Principles and Applications of Aircraft Physical Science	10	3
71	Inspection and Repair of Airframe Components and Structures	10	3
72	Aircraft Maintenance Practices	10	3
73	Aircraft Electrical Machines	10	3
74	Aircraft Electrical Devices and Circuits	10	3
75	Aircraft Electronic Devices and Circuits	10	3
76	Aircraft Computers and Electronic Systems	10	3
78	Aviation Legislation	10	3
79	Airframe Structural Concepts and Construction Methods	10	3
80	Aircraft Hydraulic Systems	10	3
81	Aircraft Propulsion Systems	10	3
82	Airframe Systems	10	3
83	Aircraft Gas Turbine Engines	10	3
84	Aircraft Electrical Systems	10	3
85	Aircraft Instruments and Indicating Systems	10	3
86	Aircraft Gas Turbine Engine and Propeller Maintenance	10	3
87	Avionic Systems	10	3
88	Aircraft Radio and Radar Principles	10	3
89	Further Aircraft Electronic Circuits and Avionic Systems	20	3
90	Helicopter Gas Turbine Engines, Transmission, Rotors and Structures	10	3
91	Principles of Helicopter Flight and Aerodynamics	10	3
92	Mathematics for Aircraft Maintenance	10	2
93	Aircraft Explosive Devices and Regulations	10	3
94	Operation and Maintenance of Aircraft Weapons' Electrical Systems	10	3
95	Operation and Maintenance of Aircraft Assisted Escape Systems	10	3

Assessment and grading

In BTEC Nationals all units are internally assessed.

All assessment for BTEC Nationals is criterion referenced, based on the achievement of specified learning outcomes. Each unit within the qualification has specified assessment and grading criteria which are to be used for grading purposes. A summative unit grade can be awarded at pass, merit or distinction:

- to achieve a 'pass' a learner must have satisfied **all** the pass assessment criteria
- to achieve a 'merit' a learner must additionally have satisfied **all** the merit grading criteria
- to achieve a 'distinction' a learner must additionally have satisfied **all** the distinction grading criteria.

Learners who complete the unit but who do not meet all the pass criteria are graded 'unclassified'.

Grading domains

The grading criteria are developed in relation to grading domains which are exemplified by a number of indicative characteristics at the level of the qualification.

There are four BTEC National grading domains:

- application of knowledge and understanding
- development of practical and technical skills
- personal development for occupational roles
- application of generic skills.

Please refer to *Annexe B* which shows the merit and distinction indicative characteristics.

Guidance

The purpose of assessment is to ensure that effective learning has taken place to give learners the opportunity to:

- meet the assessment and grading criteria and
- achieve the learning outcomes within the units.

All the assignments created by centres should be reliable and fit for purpose, and should build on the assessment and grading criteria. Assessment tasks and activities should enable learners to produce valid, sufficient and reliable evidence that relates directly to the specified criteria. Centres should enable learners to produce evidence in a variety of different forms, including written reports, graphs and posters, along with projects, performance observation and time-constrained assessments.

Centres are encouraged to emphasise the practical application of the assessment and grading criteria, providing a realistic scenario for learners to adopt, and making maximum use of practical activities and work experience. The creation of assignments that are fit for purpose is vital to achievement and their importance cannot be over-emphasised.

The assessment and grading criteria must be clearly indicated in the fit-for-purpose assignments. This gives learners focus and helps with internal verification and standardisation processes. It will also help to ensure that learner feedback is specific to the assessment and grading criteria.

When looking at the assessment and grading grids and designing assignments, centres are encouraged to identify common topics and themes.

The units include guidance on appropriate assessment methodology. A central feature of vocational assessment is that it allows for assessment to be:

- current, ie to reflect the most recent developments and issues
- local, ie to reflect the employment context of the delivering centre
- flexible to reflect learner needs, ie at a time and in a way that matches the learner's requirements so that they can demonstrate achievement.

Calculation of the qualification grade

Pass qualification grade

Learners who achieve the minimum eligible credit value specified by the rule of combination will achieve the qualification at pass grade (see *Rules of combination for Pearson BTEC Level 3 National qualifications*).

Qualification grades above pass grade

Learners will be awarded a merit or distinction or distinction* qualification grade (or combination of these grades appropriate to the qualification) by the aggregation of points gained through the successful achievement of individual units. The number of points available is dependent on the unit level and grade achieved, and the credit size of the unit (as shown in the 'points available for credits achieved at different levels and unit grades' below).

Points available for credits achieved at different levels and unit grades

The table below shows the **number of points scored per credit** at the unit level and grade.

Unit level	Points per credit		
	Pass	Merit	Distinction
Level 2	5	6	7
Level 3	7	8	9
Level 4	9	10	11

Learners who achieve the correct number of points within the ranges shown in the 'qualification grade' table will achieve the qualification merit or distinction or distinction* grade (or combinations of these grades appropriate to the qualification).

Qualification grade

BTEC Level 3 Certificate

Points range above pass grade	Grade	
230-249	Merit	M
250-259	Distinction	D
260 and above	Distinction*	D*

BTEC Level 3 Subsidiary Diploma

Points range above pass grade	Grade	
460-499	Merit	M
500-519	Distinction	D
520 and above	Distinction*	D*

BTEC Level 3 Diploma

Points range above pass grade	Grade
880-919	MP
920-959	MM
960-999	DM
1000-1029	DD
1030-1059	DD*
1060 and above	D*D*

BTEC Level 3 Extended Diploma

Points range above pass grade	Grade
1300-1339	MPP
1340-1379	MMP
1380-1419	MMM
1420-1459	DMM
1460-1499	DDM
1500-1529	DDD
1530-1559	DDD*
1560-1589	DD*D*
1590 and above	D*D*D*

Please refer to *Annexe F* for examples of calculation of qualification grade above pass grade.

Quality assurance of centres

Pearson's qualification specifications set out the standard to be achieved by each learner in order to be awarded the qualification. This is covered in the statement of learning outcomes, and assessment and grading criteria in each unit. Further guidance on delivery and assessment is given in the *Essential guidance for tutors* section in each unit. This section is designed to provide additional guidance and amplification related to the unit to support tutors, deliverers and assessors and to provide for a coherence of understanding and a consistency of delivery and assessment.

Approval

Centres that have not previously offered BTEC qualifications will first need to apply for, and be granted, centre approval before they can apply for approval to offer the programme.

When a centre applies for approval to offer a BTEC qualification they are required to enter into an approvals agreement.

The approvals agreement is a formal commitment by the head or principal of a centre to meet all the requirements of the specification and any linked codes or regulations. Sanctions and tariffs may be applied if centres do not comply with the agreement. Ultimately, this could result in the suspension of certification or withdrawal of approval.

Centres will be allowed 'accelerated approval' for a new programme where the centre already has approval for a programme that is being replaced by the new programme.

The key principles of quality assurance are that:

- a centre delivering BTEC programmes must be an approved centre and must have approval for programmes or groups of programmes that it is operating
- 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 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; planning, monitoring and recording of assessment processes; and for dealing with special circumstances, appeals and malpractice.

The approach of quality assured assessment is made through a partnership between an approved centre and Pearson. Pearson is committed to ensuring that it follows best practice and employs appropriate technology to support quality assurance processes where practicable. Therefore, the specific arrangements for working with centres will vary. Pearson seeks to ensure that the quality assurance processes that it uses do not place undue bureaucratic processes on centres and works to support centres in providing robust quality assurance processes.

Pearson monitors and supports centres in the effective operation of assessment and quality assurance. The methods which it uses to do this for BTEC First and National programmes these include:

- ensuring that all centres have completed appropriate declarations at the time of approval undertaking approval visits to centres where necessary
- requiring all centres to appoint a Lead Internal Verifier for designated groups of programmes and to ensure that this person is trained and supported in carrying out that role
- requiring that the Lead Internal Verifier completes compulsory online standardisation related to assessment and verification decisions for the designated programme
- assessment sampling and verification, through requested samples of assessments, completed assessed learner work and associated documentation
- overarching review and assessment of a centre's strategy for assessing and quality assuring its BTEC programmes.

Pearson Quality Assurance Handbook

Centres should refer to the *Handbook for Quality Assurance for BTEC Qualifications*, issued annually, for detailed guidance.

An approved centre must make certification claims only when authorised by Pearson and strictly in accordance with requirements for reporting.

Centres that do not fully address and maintain rigorous approaches to quality assurance will be prevented from seeking certification for individual programmes or for all BTEC First and National programmes. Centres that do not comply with remedial action plans may have their approval to deliver qualifications removed.

Programme design and delivery

BTEC National qualifications consist of mandatory units and optional units. Optional units are designed to provide a focus to the qualification and give more specialist opportunities in the sector. In BTEC Nationals each unit has a number of *guided learning hours* and centres are advised to take this into account.

Mode of delivery

Pearson does not define the mode of study for BTEC Nationals. Centres are free to offer the qualifications using any mode of delivery (such as full time, part time, evening only, distance learning) that meets their learners' needs. Whichever mode of delivery is used, centres must ensure that learners have appropriate access to the resources identified in the specification and to the subject specialists delivering the units. This is particularly important for learners studying for the qualification through open or distance learning.

Learners studying for the qualification on a part-time basis bring with them a wealth of experience that should be utilised to maximum effect by tutors and assessors. The use of assessment evidence drawn from learners' work environments should be encouraged. Those planning the programme should aim to enhance the vocational nature of the qualification by:

- liaising with employers to ensure a course relevant to learners' specific needs
- accessing and using non-confidential data and documents from learners' workplaces
- including sponsoring employers in the delivery of the programme and, where appropriate, in the assessment
- linking with company-based/workplace training programmes
- making full use of the variety of experience of work and life that learners bring to the programme.

Resources

BTEC Nationals are designed to prepare learners for employment in specific occupational sectors. Physical resources need to support the delivery of the programme and the proper assessment of the learning outcomes and should, therefore, normally be of industry standard. Staff delivering programmes and conducting the assessments should be familiar with current practice and standards in the sector concerned. Centres will need to meet any specific resource requirements to gain approval from Pearson.

Where specific resources are required these have been indicated in individual units in the *Essential resources* sections.

Delivery approach

It is important that centres develop an approach to teaching and learning that supports the specialist vocational nature of BTEC National qualifications and the mode of delivery. Specifications give a balance of practical skill development and knowledge requirements, some of which can be theoretical in nature. Tutors and assessors need to ensure that appropriate links are made between theory and practical application and that the knowledge base is applied to the sector. This requires the development of relevant and up-to-date teaching materials that allow learners to apply their learning to actual events and activity within the sector. Maximum use should be made of the learner's experience.

An outline learning plan is included in every unit as guidance which demonstrates one way in planning the delivery and assessment of the unit. The outline learning plan can be used in conjunction with the programme of suggested assignments.

Where the qualification has been designated and approved as a Technical Certificate and forms part of an Apprenticeship scheme, particular care needs to be taken to build strong links between the learning and assessment for the BTEC National qualification and the related NVQs and Functional Skills that also contribute to the scheme.

Meeting local needs

Centres should note that the qualifications set out in this specification have been developed in consultation with centres and employers and the Sector Skills Councils or the Standards Setting Bodies for the relevant sector. Centres should make maximum use of the choice available to them within the optional units to meet the needs of their learners, and local skills and training needs.

In certain circumstances, units in this specification might not allow centres to meet a local need. In this situation, Pearson will ensure that the rule of combination allows centres to make use of units from other BTEC specifications in this suite. Centres are required to ensure that the coherence and purpose of the qualification is retained and to ensure that the vocational focus is not diluted.

Limitations on variations from standard specifications

The flexibility to import standard units from other BTEC Nationals is limited to a total of 25 per cent of the qualification credit value (see *Rules of combination for Pearson BTEC Level 3 National qualifications*).

These units cannot be used at the expense of the mandatory units in any qualification.

Additional and specialist learning

Additional and specialist learning (ASL) consists of accredited qualifications at the same level as, or one level above, a 14-19 Diploma course of study, which has been approved under Section 96 of the Learning and Skills Act 2000. The ASL may include BTEC qualifications which are also available to learners not following a 14-19 Diploma course of study.

ASL qualifications are listed on the 14-19 Diploma Catalogue which is available on the Register of Regulated Qualifications (www.ofqual.gov.uk).

Functional Skills

BTEC Nationals give learners opportunities to develop and apply Functional Skills.

Functional Skills are offered as stand-alone qualifications at Level 2. See individual units for opportunities to cover ICT, Mathematics and English Functional Skills.

Personal, learning and thinking skills

Opportunities are available to develop personal, learning and thinking skills (PLTS) within sector-related context. PLTS are identified in brackets after the unit pass criteria to which they are associated and they are also mapped in *Annexe C*. Further opportunities for learners to demonstrate these skills may also be apparent as learners progress throughout their learning.

Access and recruitment

Pearson's policy regarding access to its qualifications is that:

- they should be available to everyone who is capable of reaching the required standards
- they should be free from any barriers that restrict access and progression
- there should be equal opportunities for all wishing to access the qualifications.

Centres are required to recruit learners to BTEC qualifications with integrity. This will include ensuring that applicants have appropriate information and advice about the qualifications and that the qualification will meet their needs. Centres should take appropriate steps to assess each applicant's potential and make a professional judgement about their ability to successfully complete the programme of study and achieve the qualification. This assessment will need to take account of the support available to the learner within the centre during their programme of study and any specific support that might be necessary to allow the learner to access the assessment for the qualification. Centres should consult Pearson's policy on learners with particular requirements.

Centres will need to review the entry profile of qualifications and/or experience held by applicants, considering whether this profile shows an ability to progress to a Level 4 qualification. For learners who have recently been in education, the profile is likely to include one of the following:

- a BTEC Level 2 qualification in engineering or a related vocational area
- a standard of literacy and numeracy supported by a general education equivalent to four GCSEs at grade A*-C
- other related Level 2 qualifications
- related work experience.

More mature learners may present a more varied profile of achievement that is likely to include experience of paid and/or unpaid employment.

Restrictions on learner entry

Most BTEC National qualifications are accredited on the for learners aged 16 years and over.

In particular sectors the restrictions on learner entry might also relate to any physical or legal barriers, for example people working in health, care or education are likely to be subject to police checks.

Access arrangements and special considerations

Pearson's policy on access arrangements and special considerations for BTEC and Pearson NVQ qualifications aims to enhance access to the qualifications for learners with disabilities and other difficulties (as defined by the 1995 Disability Discrimination Act and the amendments to the Act) without compromising the assessment of skills, knowledge, understanding or competence.

Further details are given in the policy *Access Arrangements and Special Considerations for BTEC and Pearson NVQ Qualifications*, which can be found on the Pearson website (www.pearson.com). This policy replaces the previous Pearson policy (Assessment of Vocationally Related Qualification: Regulations and Guidance Relating to Learners with Special Requirements, 2002) concerning learners with particular requirements.

Recognition of Prior Learning

Recognition of Prior Learning (RPL) is a method of assessment (leading to the award of credit) that considers whether a learner can demonstrate that they can meet the assessment requirements for a unit through knowledge, understanding or skills they already possess and so do not need to develop through a course of learning.

Pearson encourages centres to recognise learners' previous achievements and experiences whether at work, home and at leisure, as well as in the classroom. RPL provides a route for the recognition of the achievements resulting from continuous learning.

RPL enables recognition of achievement from a range of activities using any valid assessment methodology. Provided that the assessment requirements of a given unit or qualification have been met, the use of RPL is acceptable for accrediting a unit, units or a whole qualification. Evidence of learning must be valid and reliable.

Unit format

All units in Pearson BTEC Level 3 National qualifications have a standard format. The unit format is designed to give guidance on the requirements of the qualification for learners, tutors, assessors and those responsible for monitoring national standards.

Each unit has the following sections.

Unit title

The unit title will appear on the learner's Notification of Performance (NOP).

Level

All units and qualifications have a level assigned to them, which represents the level of achievement. There are nine levels of achievement, from Entry Level to Level 8. The level of the unit has been informed by the level descriptors and, where appropriate, the National Occupational Standards (NOS) and/or other sector/professional benchmarks.

Credit value

Each unit in BTEC National qualifications has a credit value; learners will be awarded credits for the successful completion of whole units.

A credit value specifies the number of credits that will be awarded to a learner who has achieved all the learning outcomes of the unit.

Guided learning hours

Guided learning hours for the unit as defined in page 3.

Aim and purpose

The aim provides a clear summary of the purpose of the unit and is a succinct statement that summarises the learning outcomes of the unit.

Unit introduction

The unit introduction gives the reader an appreciation of the unit in the vocational setting of the qualification, as well as highlighting the focus of the unit. It gives the reader a snapshot of the unit and the key knowledge, skills and understanding gained while studying the unit. The unit introduction also highlights any links to the appropriate vocational sector by describing how the unit relates to that sector.

Learning outcomes

Learning outcomes state exactly what a learner should 'know, understand or be able to do' as a result of completing the unit.

Unit content

The unit content identifies the breadth of knowledge, skills and understanding needed to design and deliver a programme of learning to achieve each of the learning outcomes. This is informed by the underpinning knowledge and understanding requirements of the related NOS. The content provides the range of subject material for the programme of learning and specifies the skills, knowledge and understanding required for achievement of the pass, merit and distinction grading criteria.

Each learning outcome is stated in full and then the key phrases or concepts related to that learning outcome are listed in italics followed by the subsequent range of related topics.

Relationship between content and assessment criteria

The learner must have the opportunity within the delivery of the unit to cover all of the unit content.

It is not a requirement of the unit specification that all of the content is assessed. However, the indicative content will need to be covered in a programme of learning in order for learners to be able to meet the standard determined in the assessment and grading criteria. The merit and distinction grading criteria enable the learner to achieve higher levels of performance in acquisition of knowledge, understanding and skills.

Content structure and terminology

The information below shows how unit content is structured and gives the terminology used to explain the different components within the content.

- Learning outcome: this is given and in bold at the beginning of each section of content.
- Italicised sub-heading: it contains a key phrase or concept. This is content which must be covered in the delivery of the unit. Colons mark the end of an italicised sub-heading.
- Elements of content: the elements are in plain text and amplify the sub-heading. The elements must also be covered in the delivery of the unit. Semi-colons mark the end of an element.
- Brackets contain amplification of elements of content which must be covered in the delivery of the unit.
- 'eg' is a list of examples used for indicative amplification of an element (that is, the content specified in this amplification that could be covered or that could be replaced by other, similar material).

Assessment and grading grid

Each grading grid gives the assessment and grading criteria used to determine the evidence that each learner must produce in order to receive a pass, merit or distinction grade. It is important to note that the merit and distinction grading criteria require a qualitative improvement in a learner's evidence and not simply the production of more evidence at the same level.

Essential guidance for tutors

This section gives tutors additional guidance and amplification to aid understanding and a consistent level of delivery and assessment. It is divided into the following sections.

- *Delivery* – explains the content's relationship with the learning outcomes and offers guidance about possible approaches to delivery. This section is based on the more usual delivery modes but is not intended to rule out alternative approaches.
- *Outline learning plan* – the outline learning plan has been included in every unit as guidance and demonstrates one way in planning the delivery and assessment of a unit. The outline learning plan can be used in conjunction with the programme of suggested assignments.
- *Assessment* – gives amplification about the nature and type of evidence that learners need to produce in order to pass the unit or achieve the higher grades. This section should be read in conjunction with the grading criteria.
- *Suggested programme of assignments* – the table shows how the suggested assignments match and cover the assessment grading criteria.
- *Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications* – sets out links with other units within the qualification. These links can be used to ensure that learners make connections between units, resulting in a coherent programme of learning. The links show opportunities for integration of learning, delivery and assessment.
- *Essential resources* – identifies any specialist resources needed to allow learners to generate the evidence required for each unit. The centre will be asked to ensure that any requirements are in place when it seeks approval from Pearson to offer the qualification.
- *Employer engagement and vocational contexts* – provides a short list of agencies, networks and other useful contacts for employer engagement and for sources of vocational contexts.
- *Indicative reading for learners* – gives a short list of learner resource material that benchmarks the level of study.

Further information

For further information please call Customer Services on 020 7010 2188 (calls may be recorded for training purposes) or email TeachingEngineering@Pearson.com.

Useful publications

Further copies of this document and related publications can be obtained by contacting us:

Telephone: 0845 172 0205

Email: publication.orders@pearson.com

Related information and publications include:

- Functional Skills publications – specifications, tutor support materials and question papers
- the current publications catalogue and update catalogue.

Pearson publications concerning the Quality Assurance System and the internal and external verification of vocationally related programmes can be found on the Pearson website and in the Pearson publications catalogue.

NB: Most of our publications are priced. There is also a charge for postage and packing. Please check the cost when you order.

How to obtain National Occupational Standards

SEMTA

14 Upton Road
Watford
WD18 0JT

Telephone: 01923 238441

www.semta.org.uk

Professional development and training

Pearson supports UK and international customers with training related to BTEC qualifications. This support is available through a choice of training options offered in our published training directory or through customised training at your centre.

The support we offer focuses on a range of issues including:

- planning for the delivery of a new programme
- planning for assessment and grading
- developing effective assignments
- building your team and teamwork skills
- developing student-centred learning and teaching approaches
- building Functional Skills into your programme
- building in effective and efficient quality assurance systems.

The national programme of training we offer can be viewed on our website (www.pearson.com/training). You can request customised training through the website or by contacting one of our advisers in the Training from Pearson UK to discuss your training needs.

The training we provide:

- is active – ideas are developed and applied
- is designed to be supportive and thought provoking
- builds on best practice.

Our training is underpinned by the former LLUK standards for those preparing to teach and for those seeking evidence for their continuing professional development.

Annexe A

The Pearson BTEC qualification framework for the Engineering sector

Progression opportunities within the framework

Level	General qualifications	BTEC full vocationally-related qualifications	BTEC Short Courses	NVQ/occupational
8				
7				
6				
5		Pearson BTEC Level 5 HND in Manufacturing Engineering Pearson BTEC Level 5 HND in Mechanical Engineering Pearson BTEC Level 5 HND in Operations Engineering Pearson BTEC Level 5 HND in Electrical/Electronic Engineering Pearson BTEC Level 5 HND in General Engineering Edexcel BTEC Level 5 HND in Aeronautical Engineering		

Level	General qualifications	BTEC full vocationally-related qualifications	BTEC Short Courses	NVQ/occupational
4		Pearson BTEC Level 4 HNC in Manufacturing Engineering Pearson BTEC Level 4 HNC in Mechanical Engineering Pearson BTEC Level 4 HNC in Operations Engineering Pearson BTEC Level 4 HNC in Electrical/Electronic Engineering Pearson BTEC Level 4 HND in General Engineering Pearson BTEC Level 4 HND in Aeronautical Engineering		

Level	General qualifications	BTEC full vocationally-related qualifications	BTEC Short Courses	NVQ/occupational
3		Pearson BTEC Level 3 Diploma and Extended Diploma in Mechanical Engineering Pearson BTEC Level 3 Diploma and Extended Diploma in Manufacturing Engineering Pearson BTEC Level 3 Diploma and Extended Diploma in Operations and Maintenance Engineering Pearson BTEC Level 3 Diploma and Extended Diploma in Electrical/Electronic Engineering Pearson BTEC Level 3 Diploma and Extended Diploma in Aerospace Engineering		

Level	General qualifications	BTEC full vocationally-related qualifications	BTEC Short Courses	NVQ/occupational
2	GCSE Engineering GCSE Manufacturing	Pearson BTEC Level 2 Certificate, Extended Certificate and Diploma in Engineering		Level 2 NVQ in Performing Engineering Operations Level 2 NVQ in Performing Manufacturing Operations Level 2 NVQ in Business Improvement Techniques
1		Introductory Certificate and Diploma in Engineering		Level 1 NVQ in Performing Engineering Operations Level 1 NVQ in Performing Manufacturing Operations
Entry				

Annexe B

Grading domains: BTEC Level 3 generic grading domains

Grading domain 1	Indicative characteristics – merit	Indicative characteristics – distinction
Application of knowledge and understanding (Learning outcome stem <i>understand</i> or <i>know</i>)	<ul style="list-style-type: none"> Shows depth of knowledge and development of understanding in familiar and unfamiliar situations (for example explain why, makes judgements based on analysis). Applies and/or selects concepts showing comprehension of often complex theories. Applies knowledge in often familiar and unfamiliar contexts. Applies knowledge to non-routine contexts (eg assessor selection). Makes reasoned analytical judgements. Shows relationships between pass criteria. 	<ul style="list-style-type: none"> Synthesises knowledge and understanding across pass/merit criteria. Evaluates complex concepts/ideas/actions and makes reasoned and confident judgements. Uses analysis, research and evaluation to make recommendations and influence proposals. Analyses implications of application of knowledge/understanding. Accesses and evaluates knowledge and understanding to advance complex activities/context. Shows relationships with p/m criteria. Responds positively to evaluation.
Grading domain 2	Indicative characteristics – merit	Indicative characteristics – distinction
Development of practical and technical skills (Learning outcome stem <i>be able to</i>)	<ul style="list-style-type: none"> Deploys appropriate advanced techniques/processes/skills. Applies technical skill to advance non-routine activities. Advances practical activities within resource constraints. Produces varied solutions (including non-routine). Modifies techniques/processes to situations. Shows relationship between p criteria. 	<ul style="list-style-type: none"> Demonstrates creativity/originality/own ideas. Applies skill(s) to achieve higher order outcome. Selects and uses successfully from a range of advanced techniques/processes/skills. Reflects on skill acquisition and application. Justifies application of skills/methods. Makes judgements about risks and limitations of techniques/processes. Innovates or generates new techniques/processes for new situations. Shows relationship with p and m criteria.

Grading domain 3	Indicative characteristics – merit	Indicative characteristics – distinction
Personal development for occupational roles (Any learning outcome stem)	<ul style="list-style-type: none"> • Takes responsibility in planning and undertaking activities. • Reviews own development needs. • Finds and uses relevant information sources. • Acts within a given work-related context showing understanding of responsibilities. • Identifies responsibilities of employers to the community and the environment. • Applies qualities related to the vocational sector. • Internalises skills/attributes (creating confidence). 	<ul style="list-style-type: none"> • Manages self to achieve outcomes successfully. • Plans for own learning and development through the activities. • Analyses and manipulates information to draw conclusions. • Applies initiative appropriately. • Assesses how different work-related contexts or constraints would change performance. • Reacts positively to changing work-related contexts • Operates ethically in work-related environments. • Takes decisions related to work contexts. • Applies divergent and lateral thinking in work-related contexts. • Understands interdependence.
Grading domain 4	Indicative characteristics – merit	Indicative characteristics – distinction
Application of generic skills (Any learning outcome stem)	<ul style="list-style-type: none"> • Communicates effectively using appropriate behavioural and language registers. • Communicates with clarity and influence. • Makes judgements in contexts with explanations. • Explains how to contribute within a team. • Demonstrates positive contribution to team(s). • Makes adjustments to meet the needs/expectations of others (negotiation skills). • Selects and justifies solutions for specified problems. 	<ul style="list-style-type: none"> • Presents self and communicates information to meet the needs of a variety of audience. • Identifies strategies for communication. • Shows innovative approaches to dealing with individuals and groups. • Takes decisions in contexts with justifications. • Produces outputs subject to time/resource constraints. • Reflects on own contribution to working within a team. • Generates new or alternative solutions to specified problems. • Explores entrepreneurial attributes.

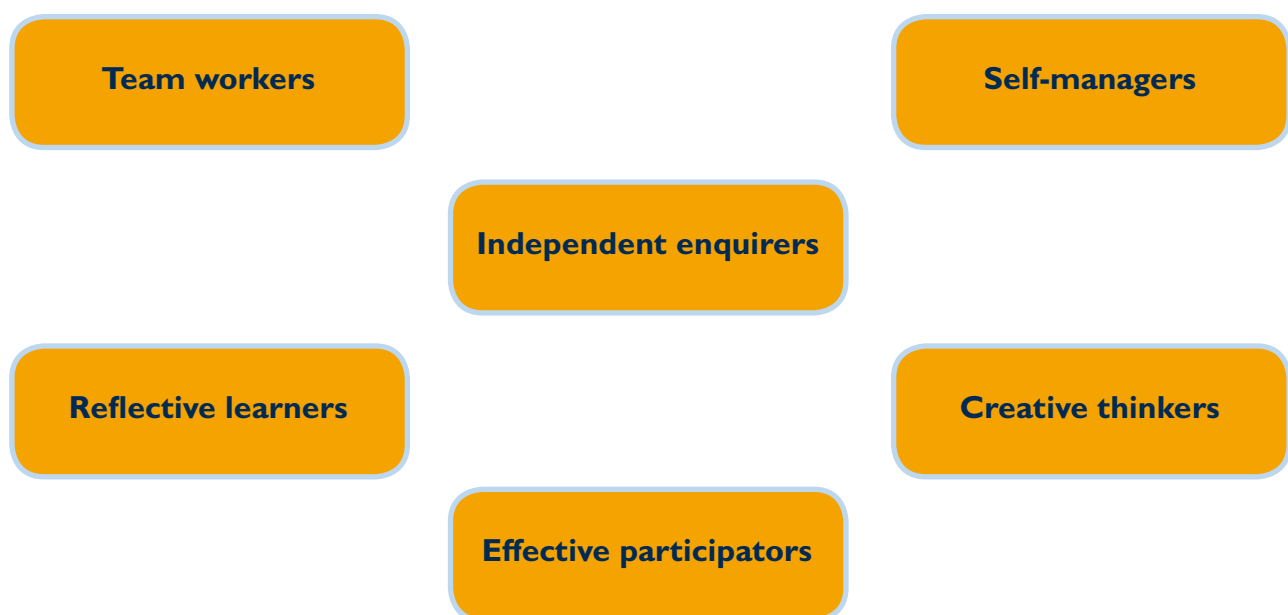
Annexe C

● Personal, learning and thinking skills

A FRAMEWORK OF PERSONAL, LEARNING AND THINKING SKILLS 11–19 IN ENGLAND

The framework comprises six groups of skills that, together with the Functional Skills of English, mathematics and ICT, are essential to success in learning, life and work. In essence the framework captures the essential skills of: managing self; managing relationships with others; and managing own learning, performance and work. It is these skills that will enable young people to enter work and adult life confident and capable.

The titles of the six groups of skills are set out below.



For each group there is a focus statement that sums up the range of skills. This is followed by a set of outcome statements that are indicative of the skills, behaviours and personal qualities associated with each group.

Each group is distinctive and coherent. The groups are also inter-connected. Young people are likely to encounter skills from several groups in any one learning experience. For example an independent enquirer would set goals for their research with clear success criteria (reflective learner) and organise and manage their time and resources effectively to achieve these (self-manager). In order to acquire and develop fundamental concepts such as organising oneself, managing change, taking responsibility and perseverance, learners will need to apply skills from all six groups in a wide range of learning contexts 11–19.

The Skills

Independent enquirers

Focus:

Young people process and evaluate information in their investigations, planning what to do and how to go about it. They take informed and well-reasoned decisions, recognising that others have different beliefs and attitudes.

Young people:

- identify questions to answer and problems to resolve
- plan and carry out research, appreciating the consequences of decisions
- explore issues, events or problems from different perspectives
- analyse and evaluate information, judging its relevance and value
- consider the influence of circumstances, beliefs and feelings on decisions and events
- support conclusions, using reasoned arguments and evidence.

Creative thinkers

Focus:

Young people think creatively by generating and exploring ideas, making original connections. They try different ways to tackle a problem, working with others to find imaginative solutions and outcomes that are of value.

Young people:

- generate ideas and explore possibilities
- ask questions to extend their thinking
- connect their own and others' ideas and experiences in inventive ways
- question their own and others' assumptions
- try out alternatives or new solutions and follow ideas through
- adapt ideas as circumstances change.

Reflective learners

Focus:

Young people evaluate their strengths and limitations, setting themselves realistic goals with criteria for success. They monitor their own performance and progress, inviting feedback from others and making changes to further their learning.

Young people:

- assess themselves and others, identifying opportunities and achievements
- set goals with success criteria for their development and work
- review progress, acting on the outcomes
- invite feedback and deal positively with praise, setbacks and criticism
- evaluate experiences and learning to inform future progress
- communicate their learning in relevant ways for different audiences.

Team workers

Focus:

Young people work confidently with others, adapting to different contexts and taking responsibility for their own part. They listen to and take account of different views. They form collaborative relationships, resolving issues to reach agreed outcomes.

Young people:

- collaborate with others to work towards common goals
- reach agreements, managing discussions to achieve results
- adapt behaviour to suit different roles and situations, including leadership role
- show fairness and consideration to others
- take responsibility, showing confidence in themselves and their contribution
- provide constructive support and feedback to others.

Self-managers

Focus:

Young people organise themselves, showing personal responsibility, initiative, creativity and enterprise with a commitment to learning and self-improvement. They actively embrace change, responding positively to new priorities, coping with challenges and looking for opportunities.

Young people:

- seek out challenges or new responsibilities and show flexibility when priorities change
- work towards goals, showing initiative, commitment and perseverance
- organise time and resources, prioritising actions
- anticipate, take and manage risks
- deal with competing pressures, including personal and work-related demands
- respond positively to change, seeking advice and support when needed
- manage their emotions, and build and maintain relationships.

Effective participators

Focus:

Young people actively engage with issues that affect them and those around them. They play a full part in the life of their school, college, workplace or wider community by taking responsible action to bring improvements for others as well as themselves.

Young people:

- discuss issues of concern, seeking resolution where needed
- present a persuasive case for action
- propose practical ways forward, breaking these down into manageable steps
- identify improvements that would benefit others as well as themselves
- try to influence others, negotiating and balancing diverse views to reach workable solutions
- act as an advocate for views and beliefs that may differ from their own.

PLTS performance indicator (suggested recording sheet)

Name:	Date:				
	Level of success 1 = low, 5 = high				
Independent enquirers					
Identify questions to answer and problems to resolve	1	2	3	4	5
Plan and carry out research, appreciating the consequences of decisions	1	2	3	4	5
Explore issues, events or problems from different perspectives	1	2	3	4	5
Analyse and evaluate information, judging its relevance and value	1	2	3	4	5
Consider the influence of circumstances, beliefs and feelings on decisions and events	1	2	3	4	5
Support conclusions, using reasoned arguments and evidence	1	2	3	4	5
Creative thinkers					
Generate ideas and explore possibilities	1	2	3	4	5
Ask questions to extend their thinking	1	2	3	4	5
Connect their own and others' ideas and experiences in inventive ways	1	2	3	4	5
Question their own and others' assumptions	1	2	3	4	5
Try out alternatives or new solutions and follow ideas through	1	2	3	4	5
Adapt ideas as circumstances change	1	2	3	4	5
Reflective learners					
Assess themselves and others, identifying opportunities and achievements	1	2	3	4	5
Set goals with success criteria for their development and work	1	2	3	4	5
Review progress, acting on the outcomes	1	2	3	4	5
Invite feedback and deal positively with praise, setbacks and criticism	1	2	3	4	5
Evaluate experiences and learning to inform future progress	1	2	3	4	5
Communicate their learning in relevant ways for different audiences	1	2	3	4	5

Team workers					
Collaborate with others to work towards common goals	1	2	3	4	5
Reach agreements, managing discussions to achieve results	1	2	3	4	5
Adapt behaviour to suit different roles and situations, including leadership roles	1	2	3	4	5
Show fairness and consideration to others	1	2	3	4	5
Take responsibility, showing confidence in themselves and their contribution	1	2	3	4	5
Provide constructive support and feedback to others	1	2	3	4	5
Self-managers					
Seek out challenges or new responsibilities and show flexibility when priorities change	1	2	3	4	5
Work towards goals, showing initiative, commitment and perseverance	1	2	3	4	5
Organise time and resources, prioritising actions	1	2	3	4	5
Anticipate, take and manage risks	1	2	3	4	5
Deal with competing pressures, including personal and work-related demands	1	2	3	4	5
Respond positively to change, seeking advice and support when needed	1	2	3	4	5
Manage their emotions, and build and maintain relationships.	1	2	3	4	5
Effective participators					
Discuss issues of concern, seeking resolution where needed	1	2	3	4	5
Present a persuasive case for action	1	2	3	4	5
Propose practical ways forward, breaking these down into manageable steps	1	2	3	4	5
Identify improvements that would benefit others as well as themselves	1	2	3	4	5
Try to influence others, negotiating and balancing diverse views to reach workable solutions	1	2	3	4	5
Act as an advocate for views and beliefs that may differ from their own	1	2	3	4	5

Note to learner: The circled number represents an indication of your PLTS performance so far.

Note to tutor: Indicate the level of success by circling the appropriate number during your feedback with the learner.

Summary of the PLTS coverage throughout the programme

Personal, learning and thinking skills	Unit									
	66	69	70	77	6	67	68	71	72	73
Independent enquirers	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Creative thinkers										
Reflective learners										
Team workers										
Self-managers		✓	✓		✓			✓	✓	✓
Effective participators										
✓ – opportunities for development										

Personal, learning and thinking skills	Unit									
	74	75	76	78	79	80	81	82	83	84
Independent enquirers	✓	✓	✓	✓	✓	✓	✓		✓	✓
Creative thinkers										
Reflective learners										
Team workers										
Self-managers								✓		✓
Effective participators										
✓ – opportunities for development										

Personal, learning and thinking skills	Unit											
	85	86	87	88	89	90	91	92	93	94	95	
Independent enquirers	✓	✓	✓	✓	✓	✓	✓	✓				
Creative thinkers												
Reflective learners												
Team workers		✓										
Self-managers		✓							✓	✓	✓	
Effective participators												
✓ – opportunities for development												

Annexe D

Wider curriculum mapping

Study of the Pearson BTEC Level 3 National in Aircraft Maintenance gives learners opportunities to develop an understanding of spiritual, moral, ethical, social and cultural issues as well as an awareness of citizenship, environmental issues, European developments, health and safety considerations and equal opportunities issues.

The Pearson BTEC Level 3 National in Aircraft Maintenance makes a positive contribution to wider curricular areas as appropriate.

Spiritual, moral, ethical, social and cultural issues

The qualification contributes to an understanding of moral and ethical issues, for example when learners are dealing with colleagues and customers.

Citizenship issues

Learners undertaking the Pearson BTEC Level 3 Nationals in Aircraft Maintenance will have the opportunity to develop their understanding of citizenship issues, for example in terms of their rights and responsibilities in the engineering workplace.

Environmental issues

Learners undertaking the Pearson BTEC Level 3 National in Aircraft Maintenance will have the opportunity to develop their understanding of environmental issues for example by considering the influence that maintenance processes can have on the environment and the ways that this impact can be reduced.

European developments

Much of the content of the Pearson BTEC Level 3 Nationals in Aircraft Maintenance applies throughout Europe even though delivery is in a UK context.

Health and safety considerations

The Pearson BTEC Level 3 Nationals in Aircraft Maintenance are practically based and health and safety issues are encountered throughout the units.

Equal opportunities issues

Equal opportunities issues are implicit throughout the Pearson BTEC Level 3 Nationals in Aircraft Maintenance.

Wider curriculum mapping

Level 3

	Unit 66	Unit 69	Unit 70	Unit 77	Unit 6	Unit 67	Unit 68	Unit 71
Spiritual								
Moral and ethical				✓				
Social and cultural				✓				
Citizenship issues		✓	✓	✓				
Environmental issues								
European developments		✓	✓					
Health and safety considerations	✓	✓	✓	✓		✓	✓	✓
Equal opportunities issues		✓	✓	✓	✓	✓	✓	✓

	Unit 81	Unit 82	Unit 83	Unit 84	Unit 85	Unit 86	Unit 87	Unit 88
Spiritual								
Moral and ethical								
Social and cultural								
Citizenship issues								
Environmental issues								
European developments								
Health and safety considerations	✓						✓	✓
Equal opportunities issues	✓	✓	✓	✓	✓	✓	✓	✓

	Unit 89	Unit 90	Unit 91	Unit 92	Unit 93	Unit 94	Unit 95
Spiritual							
Moral and ethical							
Social and cultural							
Citizenship issues							
Environmental issues							
European developments							
Health and safety considerations		✓			✓	✓	✓
Equal opportunities issues	✓	✓	✓	✓	✓	✓	✓

	Unit 1	Unit 2	Unit 5	Unit 6	Unit 7	Unit 8	Unit 12	Unit 28
Spiritual								
Moral and ethical	✓	✓			✓			
Social and cultural	✓	✓			✓			
Citizenship issues	✓	✓			✓			
Environmental issues	✓				✓			
European developments	✓				✓	✓		
Health and safety considerations	✓				✓			
Equal opportunities issues	✓	✓	✓	✓	✓	✓	✓	✓

Annexe E

National Occupational Standards/mapping with NVQs

The grid below maps the knowledge covered in the Pearson BTEC Level 3 Extended Diploma in Aircraft Maintenance against the underpinning knowledge of the Level 3 NVQ in Aeronautical Engineering Semta SSC National Occupational Standards.

KEY

Relevant NVQ units are listed where the BTEC unit provides partial coverage of the underpinning knowledge and understanding.

A blank space indicates no coverage of the underpinning knowledge.

	Units									
NVQs	66	69	70	77	6	67	68	71	72	73
Level 3 NVQ in Aeronautical Engineering		Units 8, 12, 13, 62	Units 8, 12, 13, 62					Units 13, 14, 151, 173, 326, 327, 329	Units 301, 302, 303, 304	Units 134

	Units									
NVQs	74	75	76	78	79	80	81	82	83	84
Level 3 NVQ in Aeronautical Engineering	Units 120, 134,	Units 120, 133	Units 122, 129, 174		Units 10, 11, 13, 14, 151, 173, 202, 326, 327	Units 41, 146, 169, 313, 316, 331	Units 153, 154, 155, 310, 314	Units 43, 44, 45, 55, 56, 57, 147, 148, 150, 155		Units 76

	Units										
NVQs	85	86	87	88	89	90	91	92	93	94	95
Level 3 NVQ in Aeronautical Engineering	Units 63, 73, 85	Units 153, 331	Units 79, 80, 81					Unit 5			

Annexe F

Examples of calculation of qualification grade above pass grade

Pearson will automatically calculate the qualification grade for your learners when your learner unit grades are submitted.

The generic examples below demonstrate how the qualification grade above pass is calculated using the following two tables which are also shown in the section earlier on in the specification *Calculation of the qualification grades above pass grade*.

Points available for credits achieved at different levels and unit grades

The table below shows the **number of points scored per credit** at the unit level and grade.

Unit level	Points per credit		
	Pass	Merit	Distinction
Level 2	5	6	7
Level 3	7	8	9
Level 4	9	10	11

Learners who achieve the correct number of points within the ranges shown in the 'qualification grade' table below will achieve the qualification merit, distinction or distinction* grades (or combinations of these grades appropriate to the qualification).

Qualification grade

BTEC Level 3 Certificate

Points range above pass grade	Grade	
230-249	Merit	M
250-259	Distinction	D
260 and above	Distinction*	D*

BTEC Level 3 Subsidiary Diploma

Points range above pass grade	Grade	
460-499	Merit	M
500-519	Distinction	D
520 and above	Distinction*	D*

BTEC Level 3 Diploma

Points range above pass grade	Grade
880-919	MP
920-959	MM
960-999	DM
1000-1029	DD
1030-1059	DD*
1060 and above	D*D*

BTEC Level 3 Extended Diploma

Points range above pass grade	Grade
1300-1339	MPP
1340-1379	MMP
1380-1419	MMM
1420-1459	DMM
1460-1499	DDM
1500-1529	DDD
1530-1559	DDD*
1560-1589	DD*D*
1590 and above	D*D*D*

Example 1

Achievement of pass qualification grade

A learner completing a 30-credit Pearson BTEC Level 3 Certificate **does not** achieve the points required to gain a merit qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	3	10	Pass	7	$10 \times 7 = 70$
Unit 2	3	10	Pass	7	$10 \times 7 = 70$
Unit 3	3	10	Merit	8	$10 \times 8 = 80$
Qualification grade totals		30	Pass		220

Example 2

Achievement of merit qualification grade

A learner completing a 30-credit Pearson BTEC Level 3 Certificate achieves the points required to gain a merit qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	3	10	Pass	7	$10 \times 7 = 70$
Unit 2	3	10	Merit	8	$10 \times 8 = 80$
Unit 3	3	10	Merit	8	$10 \times 8 = 80$
Qualification grade totals			Merit		230

Example 3

Achievement of distinction qualification grade

A learner completing a 60-credit Pearson BTEC Level 3 Subsidiary Diploma achieves the points required to gain a distinction qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	3	10	Merit	8	$10 \times 8 = 80$
Unit 2	3	10	Distinction	9	$10 \times 9 = 90$
Unit 3	3	10	Distinction	9	$10 \times 9 = 90$
Unit 5	3	10	Merit	8	$10 \times 8 = 80$
Unit 6	2	10	Distinction	7	$10 \times 7 = 70$
Unit 11	3	10	Distinction	9	$10 \times 9 = 90$
Qualification grade totals		60	Distinction		500

Example 4

Achievement of distinction merit qualification grade

A learner completing a 120-credit Pearson BTEC Level 3 Diploma achieves the points required to gain a distinction merit qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	3	10	Merit	8	$10 \times 8 = 80$
Unit 2	3	10	Distinction	9	$10 \times 9 = 90$
Unit 3	3	10	Distinction	9	$10 \times 9 = 90$
Unit 4	3	10	Merit	8	$10 \times 8 = 80$
Unit 5	3	10	Merit	8	$10 \times 8 = 80$
Unit 6	2	10	Distinction	7	$10 \times 7 = 70$
Unit 11	3	10	Distinction	9	$10 \times 9 = 90$
Unit 15	4	10	Merit	10	$10 \times 10 = 100$
Unit 17	3	10	Pass	7	$10 \times 7 = 70$
Unit 18	3	10	Pass	7	$10 \times 7 = 70$
Unit 25	3	20	Merit	8	$20 \times 8 = 160$
Qualification grade totals		120	Distinction Merit		980

Example 5

Achievement of merit merit merit qualification grade

A learner completing a 180-credit Pearson BTEC Level 3 Extended Diploma achieves the points required to gain a merit merit merit qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	3	10	Merit	8	$10 \times 8 = 80$
Unit 2	3	10	Pass	7	$10 \times 7 = 70$
Unit 3	3	10	Distinction	9	$10 \times 9 = 90$
Unit 4	3	10	Merit	8	$10 \times 8 = 80$
Unit 5	3	10	Pass	7	$10 \times 7 = 70$
Unit 6	2	10	Distinction	7	$10 \times 7 = 70$
Unit 11	3	10	Distinction	9	$10 \times 9 = 90$
Unit 12	3	10	Merit	8	$10 \times 8 = 80$
Unit 15	4	10	Pass	9	$10 \times 9 = 90$
Unit 17	3	10	Pass	7	$10 \times 7 = 70$
Unit 18	3	10	Pass	7	$10 \times 7 = 70$
Unit 20	3	10	Pass	7	$10 \times 7 = 70$
Unit 22	3	10	Merit	8	$10 \times 8 = 80$
Unit 25	3	20	Pass	7	$20 \times 7 = 140$
Unit 35	3	10	Distinction	9	$10 \times 9 = 90$
Unit 36	3	10	Merit	8	$10 \times 8 = 80$
Unit 38	3	10	Distinction	9	$10 \times 9 = 90$
Qualification grade totals		180	Merit Merit Merit		1410

Annexe G

Additional content required for full coverage of European Aviation Safety Agency (EASA) Part 66 syllabus

Below is the additional content needed for full coverage of the relevant modules in the EASA Part 66 syllabus.

In addition to this extra teaching material, all learners aiming to achieve success in the relevant EASA Part 66 modules must also cover all the 'eg' material within each of the appropriate BTEC National units of the programme.

EASA Part 66 subject module	Applicable BTEC unit/s	Additional material	GLH
Module 1: Mathematics	<i>Unit 92: Mathematics for Aircraft Maintenance</i>	None	
Module 2: Physics	<i>Unit 67: Principles and Applications of Aircraft Mechanical Science</i>	None	
	<i>Unit 68: Principles and Applications of Aircraft Physical Science</i>	None	
Module 3: Electrical Fundamentals	<i>Unit 6: Electrical and Electronic Principles</i>	<i>AC circuit theory: non-sinusoidal waveforms – square and triangular waves</i>	1 hr
	<i>Unit 73: Aircraft Electrical Machines</i>	<i>Generator construction: starter generator</i> <i>Generator distribution and control: three-phase star/delta connections</i>	5 hrs
	<i>Unit 74: Aircraft Electrical Devices and Circuits</i>	<i>Static electricity and conduction: distribution of electrostatic charge, electrostatic laws of attraction and repulsion, Coulomb's Law</i> <i>Terminology: conductance, conventional current flow, electron flow</i> <i>Generation of electricity: by light, heat, friction and pressure</i> <i>DC source of electricity devices: thermocouple operation and construction</i> <i>Magnetism: action of a magnet suspended in the earth's magnetic field, magnetic shielding, types of magnetic material, construction and types of material used</i>	6 hrs

EASA Part 66 subject module	Applicable BTEC unit/s	Additional material	GLH
Module 4: Electronic Fundamentals	Unit 75: Aircraft Electronic Devices and Circuits	The following additions to this unit are only required by prospective BI engineers: Diodes: characteristics and properties; diodes in series and parallel; characteristics and use of silicon-controlled rectifiers (thyristors); light-emitting diode, photo conductive diode, varistor, rectifier diodes Linear circuits: description and operation of simple operational amplifier circuits Printed circuit boards: description and use	5 hrs 5 hrs 5 hrs
	Unit 89: Further Aircraft Electronic Circuits and Avionic Systems	None	
Module 5: Digital Techniques and Electronic Instrument Systems 5.1, 5.3, 5.4, 5.6, 5.7, 5.10, 5.11, 5.12, 5.13, 5.14, 5.15, 11.18, 13.10 5.5	Unit 76: Aircraft Computers and Electronic Systems	None	
	Unit 76: Aircraft Computers and Electronic Systems	The following additions to this unit are only required by prospective BI engineers: Logic circuits: basic logic elements and their symbols (AND, OR, exclusive-OR, NAND, NOR and NOT gates); basic logic schematic diagrams; use/applications of logic circuits for aircraft systems eg flip-flops, digital clocks, adders, schematic diagrams	10 hrs
	Unit 89: Further Aircraft Electronic Circuits and Avionic Systems	None	
	Unit 92: Mathematics for Aircraft Maintenance	None	
Module 6: Materials and Hardware	Unit 70: Aircraft Materials and Hardware	None	

EASA Part 66 subject module	Applicable BTEC unit/s	Additional material	GLH
Module 7: Maintenance Practices	Unit 69: Aircraft Workshop Principles and Practice	None	
	Unit 71: Inspection and Repair of Airframe Components and Structures	None	
	Unit 72: Aircraft Maintenance Practices	Aircraft handling: aircraft storage methods, effects of environment conditions on aircraft handling and operation, de-icing/anti-icing procedures Airframe structure: symmetry (methods of alignment and symmetry checks), doors and emergency exits, air-stairs	8 hrs
Module 8: Aerodynamics (and 11.1 and 13.1)	Unit 66: Theory of Flight	Factor affecting airflow: airflow in engine intakes Rotary wing aerodynamics: terminology (blade pitch, cyclic pitch, flapping and drag hinges, tail rotor, coning angle, rotor head); operation and effect of cyclic, collective and anti-torque controls	4 hrs
Module 9: Human Factors	Unit 77: Human Factors in Aircraft Engineering	None	
Module 10: Aviation Legislation	Unit 78: Aviation Legislation	None	
Module 11: Aeroplane Aerodynamics, Structures and Systems 11.1 11.2, 11.3 11.4, 11.7, 11.8, 11.10, 11.12, 11.15, 11.16, 11.17	Unit 66: Theory of Flight	See addendum material under module 8	4 hrs
	Unit 79: Airframe Structural Concepts and Construction Methods	None	
	Unit 82: Airframe Systems	Fuel systems: dumping, venting and draining; cross-fed and fuel transfer; longitudinal balance fuel systems Fire protection: smoke detection; warnings and system tests Ice and rain protection: ice formation, classification and detection; effects of ice and snow; probe and drain heating Oxygen: charging, indication and warning Pneumatic/vacuum: indication and warnings; emphasis on interfaces with other systems; Pitot-static system Cabin equipment: water waste system layout, supply, distribution, servicing and draining; toilet system lay-out, flushing, servicing and corrosion	15 hrs

EASA Part 66 subject module	Applicable BTEC unit/s	Additional material	GLH
11.5, 13.8, 15.4	Unit 85: Aircraft Instruments and Indicating Systems	None	
11.6, 13.5	Unit 73: Aircraft Electrical Machines	None	
11.9, 11.11, 11.13	Unit 80: Aircraft Hydraulic Systems	Flight controls: active load control; pneumatic, electrical and fly-by-wire system operation; balancing and rigging; stall protection/warning Hydraulic power: electrical and pneumatic system pressure generation; interface with other systems	10 hrs 5 hrs
11.4	Unit 84: Aircraft Electrical Systems	Airframe electrical systems: anti-collision lights; cabin, cockpit and cargo lights; emergency lights	5 hrs
Module 13: Aircraft Aerodynamics, Structures and Systems			
13.1	Unit 66: Theory of Flight	See addendum material under module 8	4 hrs
13.2	Unit 79: Airframe Structural Concepts and Construction Methods	None	
13.3	Unit 89: Further Aircraft Electronic Circuits and Avionic Systems	None	
13.4	Unit 87: Avionic Systems	None	
	Unit 88: Aircraft Radio and Radar Principles	Navigation, radio and radar systems: VLF/Omega, radio altimeters	5 hrs
13.5	Unit 73: Aircraft Electrical Machines	None	
13.6, 13.9	Unit 87: Avionic Systems	Equipment and furnishings: electronic emergency equipment requirements; cabin entertainment equipment Lights: anti-collision lights; cabin, cockpit and cargo lights; emergency lights	25 hrs
13.7	Unit 87: Avionic Systems or Unit 89: Further Aircraft Electronic Circuits and Avionic Systems	Aeroplane flight control: active load control; control system operation manual, hydraulic pneumatic; stall protection systems; artificial feel	10 hrs
13.8	Unit 89: Further Aircraft Electronic Circuits and Avionic Systems	None	
13.10	Unit 76: Aircraft Computers and Electronic Systems	None	
Module 14: Propulsion	Unit 89: Further Aircraft Electronic Circuits and Avionic Systems	None	

EASA Part 66 subject module	Applicable BTEC unit/s	Additional material	GLH
Module 15: Gas Turbine Engines			
15.3, 15.9, 15.10, 15.12, 15.18, 15.20	Unit 81: Aircraft Propulsion Systems	FADEC: basic operation of FADEC (full authority digital engine control) Ice detection and protection systems: intake/inlet ice protection; air systems (operation of air distribution and anti-ice control systems including internal engine cooling/sealing and external air services)	3 hrs 5 hrs
15.1, 15.3, 15.4, 15.5, 5.6, 15.7, 15.8, 15.13, 15.15, 15.16, 15.17	Unit 83: Aircraft Gas Turbine Engines	Basic principles thrust equations: gross thrust, net thrust, choked nozzle thrust, resultant thrust, thrust horse power, equivalent shaft horsepower General construction and operation: bearings and seals; fan balancing; compressors (variable stator vanes, rotating stator blades); turbine nozzle guide vanes; exhaust; engine noise reduction; thrust reversers Performance: thrust distribution, specific fuel consumption, engine efficiencies, pressure, temperature and velocity of gas flow; engine ratings, static thrust, influence of speed, altitude and hot climate on efficiency, flat rating, limitation Turbo-prop and turbo-shaft engine ancillaries: turbo-prop (gas coupled/ free turbine and gear couple turbines); reduction gears; integrated engine and propeller controls; over speed safety devices; turbo-shaft (arrangement, drive systems, reduction gearing, couplings and control systems)	6 hrs 5 hrs 6 hrs 7 hrs
15.14	Unit 85: Aircraft Instruments and Indicating Systems	None	
15.2, 15.19, 15.21, 15.22	Unit 86: Aircraft Gas Turbine Engine and Propeller Maintenance	None	
Module 17: Propeller	Unit 86: Aircraft Gas Turbine Engine and Propeller Maintenance	None	

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