



Pearson BTEC Level 3 Diploma in Engineering and Manufacturing Support Technologies

Specification

BTEC Specialist qualification

First registration March 2025

About Pearson

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1 Introducing the qualification

What are BTEC Specialist qualifications?

BTEC Specialist qualifications are work-related qualifications available from Entry to Level 3. The qualifications put learning into the context of the world of work, giving students the opportunity to apply their research, skills and knowledge in relevant and realistic work contexts. This applied, practical approach means learners build the knowledge, understanding and skills they need for career progression or further study.

Qualification purpose

The Pearson BTEC Level 3 Diploma in Engineering and Manufacturing Support Technologies is for learners who are working as, or who are intending to work as engineering and manufacturing support technicians in the engineering and manufacturing sector.

The Pearson BTEC Level 3 Diploma in Engineering and Manufacturing Support Technologies is suitable for learners to:

- develop knowledge essential to technical support of engineering operations, including safe working, communication, maths and material properties, as well as specialist new technology and sustainability areas.
- develop underpinning skills relevant to technical support in a variety of specialist areas, relating to their job role. For example, in monitoring and fault diagnosis, Computer Numerical Control systems, electronic or mechanical measurement and testing.
- achieve a qualification to prepare for employment.
- achieve a nationally recognised Level 3 qualification.
- develop own personal growth and engagement in learning.

Industry support and recognition

This qualification is supported by the E&M Support Technician Apprenticeship group as mandatory within the engineering and manufacturing support technician apprenticeship. The group includes Apex Pumps, BAE Systems, Collins Aerospace, CooperVision, EAL (EPAO), EasyJet, GTA England, IAE, J.C. Bamford Excavators Limited, JLR, McBrida, Mira Showers, NFEC, Ontic, Scott Aerospace, Xtrac.

Funding

Qualifications eligible and funded for post-16-year-olds can be found on the funding Hub.

2 Qualification summary and key information

Qualification title	Pearson BTEC Level 3 Diploma in Engineering and Manufacturing Support Technologies
Qualification Number (QN)	610/5367/3
Regulation start date	26/02/2025
Operational start date	01/03/2025
Approved age ranges	16–18 19+
Total qualification time (TQT)	1012
Guided learning hours (GLH)	780
Assessment	Internal assessment.
Grading information	The qualification and units are graded Pass/Merit/Distinction.
Entry requirements	No prior knowledge, understanding, skills or qualifications are required before learners register for this qualification.
Progression	Learners who achieve the Pearson BTEC Level 3 Diploma in Engineering and Manufacturing Support Technologies can progress to roles such as engineering manufacturing technician, control technical support engineer and to qualifications such as electrical or electronic technical support engineer (degree) and product design and development engineer (degree).

3 Qualification structure

Pearson BTEC Level 3 Diploma in Engineering and Manufacturing Support Technologies

The requirements outlined in the table below must be met for Pearson to award the qualification.

Minimum number of units that must be achieved	13
Number of mandatory units that must be achieved	4
Minimum number of optional units that must be achieved	9

Unit number	Mandatory units	Level	Guided learning hours
1	Health and Safety in the Engineering Workplace	3	60
2	Communications for Engineering Technicians	3	60
3	Mathematics for Engineering Technicians	3	60
4	Properties and Applications of Engineering Materials	3	60

Unit number	Optional units – Group A (Learners must complete a minimum of EIGHT units from this group)	Level	Guided learning hours
5	Engineering Project	3	120
6	Further Engineering Mathematics	3	60
7	Mechanical Principles of Engineering Systems	3	60
8	Applications of Mechanical Systems in Engineering	3	60
9	Organisational Efficiency and Improvement	3	60
10	Electro, Pneumatic and Hydraulic Systems and Devices	3	60
11	Engineering Drawing for Technicians	3	60
12	Computer-aided Drafting in Engineering	3	60
13	Advanced Mechanical Principles and Applications	3	60
14	Selecting and Using Programmable Controllers	3	60
15	Applications of Computer Numerical Control in Engineering	3	60
16	Computer-aided Manufacturing	3	60
17	Principles and Applications of Electronic Devices and Circuits	3	60
18	Engineering Maintenance Procedures and Techniques	3	60
19	Monitoring and Fault Diagnosis of Engineering Systems	3	60
20	Principles and Applications of Engineering Measurement Systems	3	60
21	Electronic Measurement and Testing	3	60
22	Features and Applications of Electrical Machines	3	60
23	Manufacturing Planning	3	60
24	Business Operations in Engineering	3	60
25	Mechanical Measurement and Inspection Techniques	3	60
26	Electrical and Electronic Principles in Engineering	3	60

Unit number	Optional units – Group A (Learners must complete a minimum of EIGHT units from this group)	Level	Guided learning hours
27	Engineering Design	3	60
28	Principles and Applications of Fluid Mechanics	3	60
29	Engineering Inspection and Quality Control	3	60
30	Engineering Primary Forming Processes	3	60
31	Further Electrical Principles	3	60
32	Advanced CNC Turning Techniques (barred combination with unit 33)	3	60
33	Advanced CNC Milling Techniques (barred combination with unit 32)	3	60
34	Data Communication and Networking	3	60
35	Construction and Applications of Digital Systems	3	60

Unit number	Optional units – Group B (New Technologies or Sustainability. Learners must complete a minimum of ONE unit from this group).	Level	Guided learning hours
36	Industrial Robot Technology	3	60
37	Industry 4.0	3	60
38	Data Analytics/Big Data	3	60
39	Simulation and Digital Twinning	3	60
40	Cyber Security in Engineering	3	60
41	Autonomous Systems	3	60
42	Environmental Engineering and Sustainability	3	60
43	Industrial Robotics	3	60
44	Autonomous Mobile Robotics	3	60
45	Additive Manufacturing Processes	3	60

4 Assessment requirements

The table below gives a summary of the assessment methods used in the qualification.

Units	Assessment method
All units	Internal assessment (centre-devised assessments).

Language of assessment

Learners must use English only during the assessment of this qualification.

A learner taking the qualification may be assessed in British Sign Language where it is permitted for the purpose of reasonable adjustment.

Further information on the use of language in qualifications is available in our *Use of languages in qualifications policy*, available on our website, [qualifications.pearson.com](https://www.pearson.com/qualifications).

Internal assessment

Internally assessed units are subject to standards verification. This means that centres set and mark the final summative assessment for each unit, using the examples and support that Pearson provides.

To pass each internally assessed unit, learners must:

- achieve all the specified learning outcomes
- satisfy all the assessment criteria by providing sufficient and valid evidence for each criterion
- prove that the evidence is their own.

Centres must ensure:

- assessment is carried out by assessors with relevant expertise in both the occupational area and assessment. For the occupational area, this can be evidenced by a relevant qualification or current (within three years) occupational experience that is at an equivalent level or higher than this qualification. Assessment expertise can be evidenced by qualification in teaching or assessing and/or internal quality assurance or current (within three years) experience of assessing or internal verification
- internal verification systems are in place to ensure the quality and authenticity of learners' work, as well as the accuracy and consistency of assessment.

Learners who do not successfully pass an assignment, are allowed to resubmit evidence for the assignment or to retake another assignment.

Assessment of knowledge units

To pass each knowledge unit, learners must independently complete assignment(s) that show that the learning outcomes and assessment criteria for the unit have been met.

Format of assignments for knowledge units:

- all learning outcomes and assessment criteria must be covered
- assignments can include both practical and written tasks
- assignments are independently completed as a distinct activity after the required teaching has taken place
- the brief is issued to learners with a defined start date, a completion date and clear requirements for the evidence they are required to produce
- all or parts of units can be combined into a single assignment. Learning outcomes must not be split into more than one assignment.

Each unit contains suggested tasks that centres can use to form the basis of assignments for learners to complete. It is expected that centres will contextualise these and ensure that the final version is checked by their internal verifier.

Assessment of skills units

To pass each skills unit, learners must:

- gather evidence from their course in a portfolio showing that they have met the required standard specified in the learning outcomes, assessment criteria and Pearson's quality assurance arrangements
- have an assessment record that shows how each individual assessment criterion has been met. The assessment record should be cross-referenced to the evidence provided. The assessment record should include details of the type of evidence and the date of assessment. Suitable centre documentation should be used to form an assessment record.

Learners can use one piece of evidence to prove their knowledge, skills and understanding across different assessment criteria and/or across different units. The evidence provided for each unit must reference clearly the unit that is being assessed and learners should be encouraged to signpost evidence. Evidence must be available to the assessor, the internal verifier and the Pearson Standards Verifier.

Examples of forms of evidence include observation records, reflective accounts, witness testimony and products of learners' work. Learners must provide evidence of their achievement of the knowledge-based learning outcomes and the associated assessment criteria in skills units – achievement cannot be inferred from performance.

Any specific evidence requirements for a unit are given in the unit's *Assessment* section.

5 Centre recognition and approval

Centres must have approval prior to delivering or assessing any of the units in this qualification.

Centres that have not previously offered BTEC Specialist qualifications need to apply for, and be granted, centre recognition as part of the process for approval to offer individual qualifications.

Guidance on seeking approval to deliver BTEC qualifications is given on our website.

Approvals agreement

All centres are required to enter into an approval agreement with Pearson, in which the head of centre or principal agrees to meet all the requirements of the qualification specification and to comply with the policies, procedures, codes of practice and regulations of Pearson and relevant regulatory bodies. If centres do not comply with the agreement, this could result in the suspension of certification or withdrawal of centre or qualification approval.

Centre resource requirements

As part of the approval process, centres must make sure that the resource requirements below are in place before offering the qualification:

- appropriate physical resources (for example IT, learning materials, teaching rooms) to support the delivery and assessment of the qualification
- suitable staff for delivering and assessing the qualification (see *Section 4 Assessment requirements*)
- systems to ensure continuing professional development (CPD) for staff delivering and assessing the qualification
- health and safety policies that relate to the use of equipment by learners
- internal verification systems and procedures (see *Section 4 Assessment requirements*)
- any unit-specific resources stated in individual units.

6 Access to qualifications

Access to qualifications for learners with disabilities or specific needs.

Equality and fairness are central to our work. Our *Equality, diversity and inclusion policy* requires all learners to 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 (as defined by the Equality Act 2010) are not, when they are taking one of our qualifications, disadvantaged in comparison to learners who do not share that characteristic
- all learners achieve the recognition they deserve from their qualification and that this achievement can be compared fairly to the achievement of their peers.

For learners with disabilities and specific needs, the assessment of their potential to achieve the qualification must identify, where appropriate, the support that will be made available to them during delivery and assessment of the qualification.

Centres must deliver the qualification in accordance with current equality legislation.

For full details of the Equality Act 2010, please visit www.legislation.gov.uk

Reasonable adjustments and special consideration

Centres are permitted to make adjustments to assessment to take account of the needs of individual learners. Any reasonable adjustment must reflect the normal learning or working practice of a learner in a centre or a learner working in the occupational area.

Centres cannot apply their own special consideration – applications for special consideration must be made to Pearson and can be made on a case-by-case basis only.

Centres must follow the guidance in the Pearson document *Guidance for reasonable adjustments and special consideration in vocational internally assessed units*.

7 Recognising prior learning and achievement

Recognition of Prior Learning (RPL) 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 in and outside the workplace, 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. If 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 sufficient, reliable and valid.

Further guidance is available in our policy document *Recognition of prior learning policy and process*, available on our website.

8 Quality assurance of centres

For the qualification in this specification, the Pearson quality assurance model will consist of the following processes.

Centres will receive at least one visit from our Standards Verifier, followed by ongoing support and development. This may result in more visits or remote support, as required to complete standards verification. The exact frequency and duration of Standards Verifier visits/remote sampling will reflect the level of risk associated with a programme, taking account of the:

- number of assessment sites
- number and throughput of learners
- number and turnover of assessors
- number and turnover of internal verifiers
- amount of previous experience of delivery.

Following registration, centres will be given further quality assurance and sampling guidance.

For further details, please see the work-based learning quality assurance handbooks, available in the support section of our website:

- *Pearson Work-based Learning Centre Guide to Quality Assurance*
- *Pearson Work-based Learning Delivery Guidance & Quality Assurance Requirements.*

9 Units

All units for the Pearson BTEC Level 3 Diploma in Engineering and Manufacturing Support Technologies can be found in the additional *Unit Specification*. This includes unit content, assessment criteria, assessment guidance and essential resources.

10 Appeals

Centres must have a policy for dealing with appeals from learners. Appeals may relate to assessment decisions being incorrect or assessment not being conducted fairly. The first step in such a policy is a consideration of the evidence by a Lead Internal Verifier or other member of the programme team. The assessment plan should allow time for potential appeals after learners have been given assessment decisions.

Centres must document all learners' appeals and their resolutions. Further information on the appeals process can be found in the document *Internal assessment in vocational qualifications: Reviews and appeals policy*, available on our website.

11 Malpractice

Dealing with malpractice in assessment

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

Pearson does not tolerate actual or attempted actions of malpractice by learners, centre staff or centres in connection with Pearson qualifications. Pearson may impose sanctions on learners, centre staff or centres where malpractice or attempted malpractice has been proven.

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

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 a centre is failing to conduct internal assessment according to our policies. The above document gives further information and examples. It 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.

Learner malpractice

The head of centre is required to report incidents of suspected learner malpractice that occur during Pearson qualifications. We ask centres to complete *JCQ Form M1* (www.jcq.org.uk/malpractice) and email it with any accompanying documents (signed statements from the learner, invigilator, copies of evidence, etc) to the Investigations Processing 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.

Failure to report malpractice constitutes staff or centre malpractice.

Teacher/centre malpractice

The head of centre is required to inform Pearson's Investigations team of any incident of suspected malpractice (which includes maladministration) by centre staff before any investigation is undertaken. The head of centre is requested to inform the Investigations team by submitting a *JCO M2* Form (downloadable from www.jcq.org.uk/malpractice) with supporting documentation to pqsmalpractice@pearson.com. Where Pearson receives allegations of malpractice from other sources (for example Pearson staff, anonymous informants), the Investigations team will conduct the investigation directly or may ask the head of centre to assist.

Pearson reserves the right in cases of suspected malpractice to withhold the issuing of results/certificates while an investigation is in progress. Depending on the outcome of the investigation, results and/or certificates may not be released or they may be 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, such as:

- mark reduction for affected external assessments
- disqualification from the qualification
- debarment 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:

- requiring centres to create an improvement action plan
- requiring staff members to receive further training
- placing temporary suspensions on certification of learners
- placing temporary suspensions 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 considering appeals against penalties and sanctions arising from malpractice. Appeals against a decision made by Pearson will normally be accepted only from the head of centre (on behalf of learners and/or members or staff) and from individual members (in respect of a decision taken against them personally). Further information on appeals can be found in the *JCO Appeals booklet* (www.jcq.org.uk/exams-office/appeals).

12 Understanding the qualification grade

This section explains the rules that we apply in providing an overall qualification grade for each learner. The final grade awarded for a qualification represents a holistic performance across all of the qualification.

If 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.

Awarding and reporting for the qualification

The awarding and certification of these qualifications will comply with the requirements of the Office of Qualifications and Examinations Regulation (Ofqual).

Eligibility for an award

To achieve any qualification grade learners must achieve a Pass grade or higher in:

- all four units in the mandatory group
- eight units in Optional Group A, and
- one unit in Optional Group B.

Calculation of the qualification grade

The qualification grade is an aggregation of a learner's unit level performance. The Diploma is awarded at the grade range shown in the table below.

Qualification	Available grade range
Diploma	P to D

The *Calculation of Qualification Grade* table, shown further on in this section, shows the minimum thresholds for calculating these grades.

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. Our Information Manual (available on our website) gives more 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	Unit size
	60 GLH	120 GLH
U	0	0
Pass	6	12
Merit	10	20
Distinction	16	32

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 applicable Calculation of Qualification Grade table.

To allow for a weaker performance in some units to be balanced by a stronger performance in others, there is an element of compensation built into the grading model.

Points thresholds

Applicable for registration from 1 March 2025.

Diploma	
780 GLH	
Grade	Points threshold
U	0
P	78
M	113
D	156

Examples of grade calculations

Example 1: Achievement of a Diploma with a P grade

If learners achieve more than the required GLH, the points from the highest 780GLH will be used towards the qualification grade.

	GLH	Type (Int/Ext)	Grade	Unit points
Unit A	60	Int	Pass	6
Unit B	120	Int	Pass	12
Unit C	60	Int	Pass	6
Unit D	60	Int	Merit	10
Unit E	60	Int	Merit	10
Unit F	60	Int	Pass	6
Unit G	60	Int	Pass	6
Unit H	60	Int	Pass	6
Unit I	60	Int	Pass	6
Unit J	60	Int	Pass	6
Unit K	60	Int	Pass	6
Unit L	60	Int	Pass	6
Unit M	60	Int	Pass	6
Totals	840		P	92
Totals	780		P	86

The learner has exceeded the 78-point pass threshold and has passed all units. The points from the highest 780GLH are used to calculate the overall grade.

Example 2: Achievement of a Diploma with a D grade

	GLH	Type (Int/Ext)	Grade	Unit points
Unit A	60	Int	Merit	10
Unit B	120	Int	Merit	20
Unit C	60	Int	Pass	6
Unit D	60	Int	Merit	10
Unit E	60	Int	Merit	10
Unit F	60	Int	Pass	6
Unit G	60	Int	Distinction	16
Unit H	60	Int	Distinction	16
Unit I	60	Int	Distinction	16
Unit J	60	Int	Distinction	16
Unit K	60	Int	Distinction	16
Unit L	60	Int	Distinction	16
Unit M	60	Int	Pass	6
Totals	780		D	160

The learner has exceeded the 156 threshold for Distinction and has passed all units.

Example 3: An Unclassified result for a Diploma

	GLH	Type (Int/Ext)	Grade	Unit points
Unit A	60	Int	Merit	10
Unit B	120	Int	Pass	12
Unit C	60	Int	Pass	6
Unit D	60	Int	Merit	10
Unit E	60	Int	Merit	10
Unit F	60	Int	Pass	6
Unit G	60	Int	Pass	6
Unit H	60	Int	Merit	10
Unit I	60	Int	U	0
Unit J	60	Int	Merit	10
Unit K	60	Int	Merit	10
Unit L	60	Int	Pass	6
Unit M	60	Int	Pass	6
Totals	840		U	102
Totals	780		U	96

The learner has sufficient points for P (78) but has not passed all units. Hence, the grade is U.

13 Further information and publications

- Edexcel, BTEC and Pearson Work Based Learning contact details: qualifications.pearson.com/en/contact-us.html.
- Books, software and online resources for UK schools and colleges: www.pearsonschoolsandcolleges.co.uk.
- Our publications catalogue lists all the material available to support our qualifications. To access the catalogue and order publications, please visit our website.

All centres offering external assessments must comply with the Joint Council for Qualifications (JCQ) document *Instructions for conducting examinations*.

Further documents that support the information in this specification:

- *Access arrangements and reasonable adjustments* (JCQ)
- *A guide to the special consideration process* (JCQ)
- *Collaborative and consortium arrangements for the delivery of vocational qualifications policy* (Pearson)
- *UK information manual* (updated annually and available in hard copy) **or** *Entries and information manual* (available online) (Pearson).
- *Distance learning and assessment policy* (Pearson)

Publisher information

Any publisher can seek endorsement for their resources and, if they are successful, we will list their BTEC resources on our website.

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