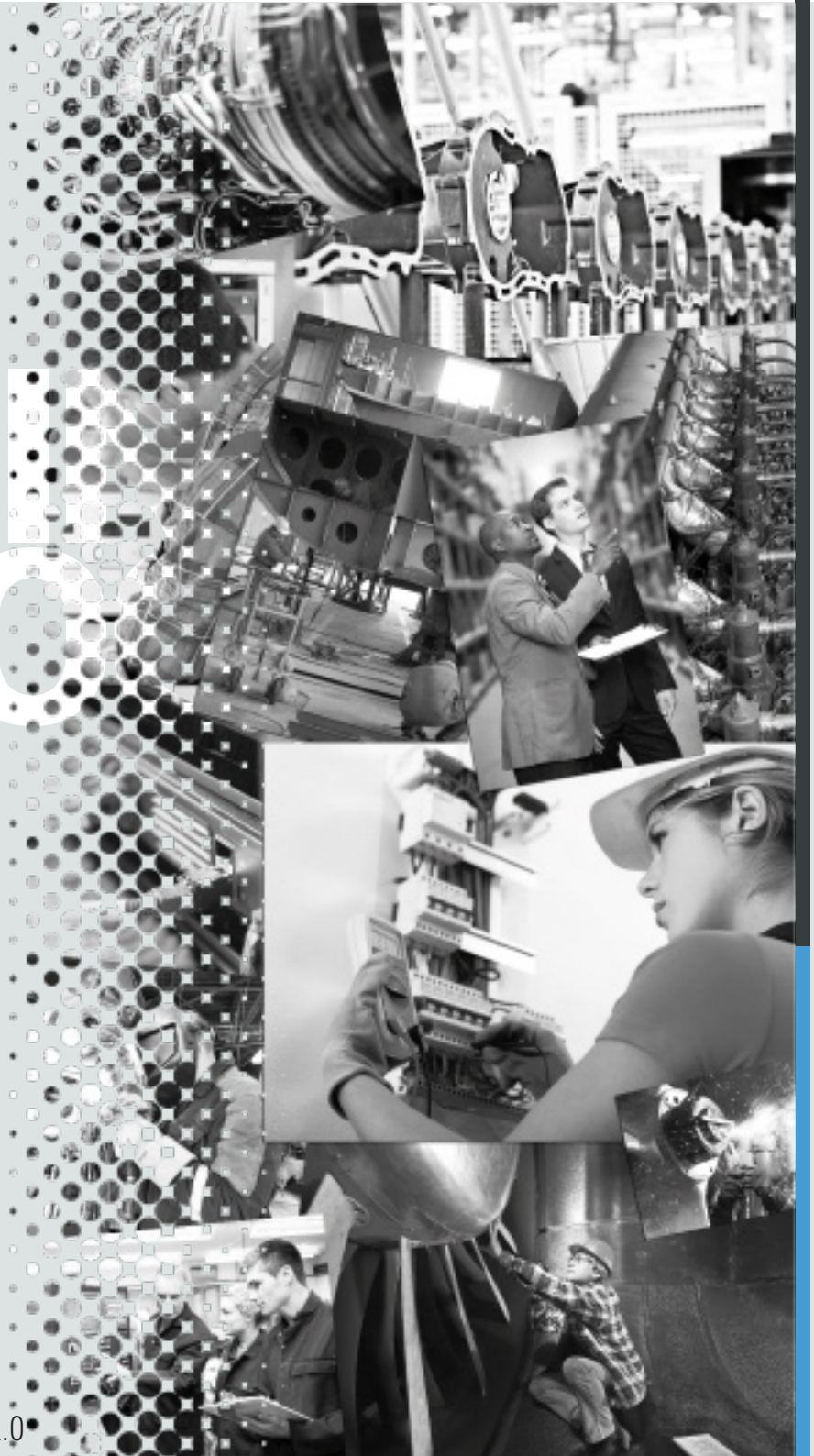
Level 3 Extended Diploma in
ENGINEERING TECHNOLOGIES



Qualification Specification

Overview
This qualification has been developed to provide learners with extensive underpinning knowledge and related practical skills in a range of engineering subjects, along with practical experience and expectations of the situations that they could face in an engineering job role.

Typical Job
Mechanical Fitter, Maintenance Engineer, Manufacturing Engineer, Electrical Engineer, Electronics Engineer, Sheet Metal Worker, CNC Operator, Welder.

Qualification code:	601/5802/5
Level:	3
Total qualification time:	980
Credit value:	Min 98 - Max 99
Guided learning hours:	Min 750 - Max 750
Minimum learning age:	16

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Purpose of qualification

The EAL Level 3 Extended Diploma in Engineering Technologies is a Vocational Related Qualification (VRQ). It has been specifically designed for learners undertaking a specific larger sized pathways within an advanced Apprenticeship or 16-19 year old learners in full time education who are interested in pursuing a career in the engineering sector, including occupations and job roles such as maintenance engineer, mechanical engineer, welder and/or fabricator, and electrical and/or electronic engineer. The qualification may also be suitable for other learners, including adults, who are interested in engineering technology and/or are considering a career change.

The qualification does not require evidence of occupational competence in the workplace. However, the units of the qualification have been derived from the relevant National Occupational Standards and so contribute to developing the skills and knowledge that have been identified to operate effectively in job roles within the Engineering Sector.

This is a graded qualification; learners can achieve a Pass, Merit or Distinction.

What does this qualification cover?
This qualification has one mandatory core unit, which provides learners with an understanding of engineering environmental health and safety, one optional unit in Group A and eight optional units in Group B. The qualification structure is listed on pages 3 - 6.

Who is this qualification for?
This qualification is predominantly for learners completing larger sized pathways within an advanced level Apprenticeship or in full time education and are interested in pursuing a career in the engineering sector. The qualification may also be suitable for learners who are interested in engineering technology and/or are considering a career change.

It is suitable for learners aged:
- 16-18
- 19+.

Who supports this qualification?
This qualification is:
- Regulated at Level 3
- Endorsed by a number of post-16 providers as facilitating completion of the knowledge requirements for specific Advanced Engineering Apprenticeships or a range of post-16 learning programmes at level 3.

What could this qualification lead to?

Typical job roles include:
Mechanical Fitter, Maintenance Engineer, Manufacturing Engineer, Electrical Engineer, Electronics Engineer, Sheet Metal Worker, CNC Operator, Welder.

This qualification relates to:
- EAL Level 3 Subsidiary Diploma in Engineering Technologies
- EAL Level 3 Diploma in Engineering Technologies
- EAL Level 3 Extended Diploma in Engineering Technologies
- EAL Level 3 Extended Diploma in Engineering Maintenance
- EAL Level 3 Extended Diploma in Installation and Commissioning
- EAL Level 3 NVQ Certificate in Rail Engineering Traction and Rolling Stock
- EAL Level 3 NVQ Diploma in Rail Engineering Track Maintenance
- EAL Level 3 NVQ Certificate in Rail Engineering Electrification Maintenance
- EAL Level 3 NVQ Diploma in Rail Engineering Signalling Maintainer and Fault Finder
- EAL Level 3 NVQ Diploma in Rail Engineering Signalling Installer
- EAL Level 3 NVQ Diploma in Rail Engineering Overhead Line Construction

Further information about apprenticeships and industry recognised qualifications in the engineering sector can be obtained from the EAL website.

Entry requirements

Learners must be at least 16 years old. There are no formal entry requirements for this qualification. However, learners must have the potential to achieve all aspects of the qualification. In particular, learners should be able to demonstrate that they have the minimum levels of literacy and numeracy required to comply with the health and safety aspects of the scheme, the completion of the learning outcomes, and the assessments.

How is the qualification achieved?

This qualification will be achieved when the learner has successfully completed:
- One mandatory core unit, comprising an on-screen multiple-choice examination
- One optional unit in Group A, comprising Centre marked practical/theory assessments
- Eight optional units in Group B, comprising Centre marked practical/theory assessments or an on-screen multiple-choice examination.

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What will be assessed?

This qualification is made up of units to which appropriate assessment methods have been applied. The units contain the learning outcomes and the assessment criteria that the learner is to be assessed against.

All learning outcomes within the qualification will be assessed. In order to meet this requirement, it is advised that centres should maintain an assessment and feedback record for each learner. This will detail the evidence evaluated against the learning outcome and the feedback given to the learner. All learner evidence must be available to the EAL External Quality Assurer.

How will it be assessed?

Assessment methods within this qualification include an on-screen multiple choice examination for one mandatory unit and one optional unit and Centre marked practical and theory assessments for the second mandatory unit and other units within the qualification structure. Assessment methods have been designed to assess the knowledge, understanding and skills of learners for all units.

The on-screen multiple choice examinations are set by EAL and marked by EAL. The internal assessment is set by EAL and marked by members of the delivery team at the Centre.

Where the assessment takes the form of written/short answer or multiple choice question papers, these must be treated as controlled assessments.

All assessment decisions are then subject to internal and external quality assurance.

Grading Criteria

Learners must achieve a Pass in ALL components for the qualification to be awarded. If learners are unsuccessful in one or more of the assessment components then the overall result for the qualification will be 'referred' and a certificate will not be awarded.

Providing learners are successful in ALL assessment components , the final grade for the qualification will be determined from the grades achieved by learners in the external examination within the mandatory unit and the centre marked assessments within the optional units.

Please refer to the Grading Criteria within the Delivery Packs and Assessment Packs on how to grade individual units.

Structure

This qualification will be obtained by the learner once they have successfully completed the **one mandatory core unit, one optional unit** from **Group A** and **eight optional units** from **Group B** from the units listed below.
The qualification has 98-99 credits and 750 guided learning hours and 980 total qualification time.

Mandatory core unit - ONE unit must be completed**:**

Unit	Unit title	Credit	GLH	Ofqual Code
QET3/001A	Engineering and environmental health and safety	9	75	L/507/0328

Optional units: Group A - ONE unit must be completed:

Unit	Unit title	Credit	GLH	Ofqual Code
QET3/009	Electrical and electronics principles	10	75	J/507/0683
QET3/016	Fabrication and welding principles	10	75	Y/507/0316
QET3/028	Maintenance engineering principles	10	75	Y/507/0347
QET3/039	Mechanical engineering principles	10	75	F/507/0357
QET3/056	Mechanical engineering principles for aircraft technicians	10	75	K/507/0384
QET3/089	Railway infrastructure - mechanical engineering principles	10	75	D/507/4223
QET3/094	Railway infrastructure - electrical engineering	10	75	Y/507/4236

Optional units: Group B - Choose units NOT already undertaken above. EIGHT units must be completed:

Unit	Unit title	Credit	GLH	Ofqual Code
QET3/002	Engineering organisational efficiency and improvement	9	75	L/507/0670
QET3/003	Engineering mathematics	10	75	T/507/0291
QET3/003A	Further engineering mathematics	10	75	R/507/0329
QET3/004	Further electrical and electronic principles	10	75	Y/507/0672
QET3/005	Further engineering science	10	75	J/507/0294

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Group B - continued

Unit	Unit title	Credit	GLH	Ofqual Code
QET3/006	Computer aided design (CAD) techniques	10	75	R/507/0296
QET3/007	Computer numerical control (CNC) programming/machining	10	75	Y/507/0297
QET3/008	Advanced personal computer (PC) maintenance	10	75	D/507/0298
QET3/009	Electrical and electronics principles	10	75	J/507/0683
QET3/010	Programmable logic controllers (PLCs)	10	75	H/507/0688
QET3/011	Measurement methods and control engineering	10	75	K/507/0305
QET3/012	Analogue electronics	10	75	M/507/0306
QET3/013	Digital electronics	10	75	T/507/0310
QET3/014	Microelectronics	10	75	A/507/0311
QET3/015	Electrical testing and commissioning	10	75	M/507/0712
QET3/016	Fabrication and welding principles	10	75	Y/507/0316
QET3/017	Pattern development	10	75	H/507/0321
QET3/018	Manual metal-arc (MMA) welding	10	75	F/507/0326
QET3/019	Metal inert gas, metal active gas (MIG/MAG)welding	10	75	J/507/0327
QET3/020	Tungsten inert gas (TIG) welding process	10	75	F/507/0715
QET3/021	Mechanised welding processes	10	75	L/507/0331
QET3/022	Automated welding processes	10	75	Y/507/0333
QET3/023	Producing sheet metal fabrications	10	75	Y/507/0543
QET3/023A	Sheet metalwork technology	10	75	K/507/0353
QET3/024	Producing plate fabrications	10	75	K/507/0546
QET3/025	Producing pipework fabrications	10	75	F/507/0343

Group B - continued

Unit	Unit title	Credit	GLH	Ofqual Code
QET3/026	Managing fabrication activities	10	75	M/507/0547
QET3/027	Shipbuilding operations	10	75	T/507/0548
QET3/028	Maintenance engineering principles	10	75	Y/507/0347
QET3/029	Maintenance of mechanical systems	10	75	D/507/0348
QET3/030	General engineering maintenance techniques	10	75	J/507/0540
QET3/031	Building mechanical maintenance systems and services	10	75	L/507/0541
QET3/032	Maintenance of refrigeration systems	10	75	R/507/0542
QET3/033	Maintenance of fluid power systems and components	10	75	D/507/0544
QET3/034	Maintenance of hydraulic systems and components	10	75	H/507/0545
QET3/035	Maintenance of pneumatic systems and components	10	75	T/507/0355
QET3/036	Electrical maintenance in buildings	10	75	Y/507/0770
QET3/037	Engineering instrumentation	10	75	A/507/0356
QET3/038	Installation of electrical equipment	10	75	L/507/0538
QET3/039	Mechanical engineering principles	10	75	F/507/0357
QET3/040	Toolmaking/ presswork/extrusion design	10	75	J/507/0358
QET3/041	Advanced manufacture techniques – computer numerical control (CNC)	10	75	L/507/0359
QET3/042	Engineering inspection and quality control	10	75	F/507/0665
QET3/043	Engineering design process	10	75	J/507/0361
QET3/044	Precision grinding	10	75	L/507/0362
QET3/045	Gear cutting	10	75	R/507/0363
QET3/046	Advanced milling	10	75	Y/507/0364
QET3/047	Advanced turning	10	75	H/507/0366
QET3/048	Specialised machining	10	75	Y/507/0722

Group B - continued

Unit	Unit title	Credit	GLH	Ofqual Code
QET3/049	Advanced manufacturing techniques	10	75	K/507/0370
QET3/050	Data communications and networking	10	75	D/507/0723
QET3/051	Fixed wing Theory of Flight	10	75	T/507/0551
QET3/052	Principles of rotorywing aircraft flight	10	75	A/507/0552
QET3/053	Rotorywing aircraft structures and transmissions	10	75	R/507/0380
QET3/054	Rotorywing aircraft gas turbine engines	10	75	L/507/0555
QET3/055	Rotorywing aircraft systems	10	75	H/507/0383
QET3/056	Mechanical engineering principles for aircraft technicians	10	75	K/507/0384
QET3/057	Radio and radar principles	10	75	M/507/0385
QET3/058	Servicing cardiovascular equipment	10	75	T/507/0386
QET3/059	Servicing physiological monitoring and infusion equipment	10	75	M/507/0600
QET3/060	Servicing medical therapeutic equipment	10	75	F/507/0388
QET3/061	Analogue systems engineering	10	75	J/507/0389
QET3/062	Panel wiring for engineering applications	10	75	D/507/0608
QET3/063	Electrical power for engineering applications	10	75	H/507/0612
QET3/064	Engineering communications	10	75	A/507/0390
QET3/076	Digital systems	10	75	F/507/0391
QET3/077	Workplace improvement	10	75	J/507/0392
QET3/078	Aircraft maintenance and manufacturing engineering procedures	10	75	F/507/0634
QET3/079	Manufacturing aircraft structures	10	75	R/507/0394
QET3/080	Assembling aircraft structures and components	10	75	Y/507/0395
QET3/081	Maintenance of aircraft structures	10	75	D/507/0396

Group B - continued

Unit	Unit title	Credit	GLH	Ofqual Code
QET3/089	Railway infrastructure - mechanical engineering principles	10	75	D/507/4223
QET3/090	Railway infrastructure - railway civil engineering	10	75	K/507/4225
QET3/091	Railway infrastructure - track engineering	10	75	A/507/4228
QET3/092	Railway infrastructure - track engineering construction	10	75	F/507/4232
QET3/093	Railway infrastructure - track engineering maintenance	10	75	J/507/4233
QET3/094	Railway infrastructure - electrical engineering	10	75	Y/507/4236
QET3/095	Railway infrastructure - overhead line equipment maintenance	10	75	H/507/4238
QET3/096	Railway infrastructure - overhead line equipment construction	10	75	K/507/4239
QET3/097	Rail vehicle traction systems	10	75	H/507/4241
QET3/098	Traction and rolling suspension, wheelsets, brakes and associated systems	10	75	M/507/4243
QET3/099	Function and characteristics of railway signalling systems	10	75	F/507/4243
QET3/100	Railway signalling systems testing and maintenance	10	75	J/508/1134