Level 3 Diploma in

ENGINEERING and TECHNOLOGY

Qualification Specification

Overview

This qualification has been developed to provide learners with 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, Sheet Metal Worker, CNC Operator, Welder, Track Engineer, Signalling Engineer, Telecoms Engineer, Overhead Line Engineer, Electrification Engineer, Casting Engineer and Traction and Rolling Stock Maintenance Engineer.

Qualification code:	501/1130/9
Level:	3
Credit value:	78
Total qualification time:	780
Guided learning hours:	600
Minimum learning age:	16

Issue 3.0

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Purpose of qualification

The EAL Level 3 Diploma in Engineering and Technology is a Vocational Related Qualification (VRQ). It has been specifically designed for learners undertaking a range of 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.

What does this qualification cover?

This qualification has two mandatory units, which provides learners with an understanding of engineering environmental health and safety and organisational efficiency and improvement and eighty eight optional units. The qualification structure is listed on pages 3 - 7.

Who is this qualification for?

This qualification is predominantly for learners completing 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:

- Accredited at Level 3
- Endorsed by a number of post-16 providers as facilitating completion of the knowledge requirements for a range of 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, Track Engineer, Signalling Engineer, Telecoms Engineer, Overhead Line Engineer, Electrification Engineer and Traction and Rolling Stock maintenance Engineer.

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:

- Two mandatory units, comprising an on-screen multiple-choice examination
- Six of the optional units, comprising Centre marked practical/theory assessments.

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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 the mandatory units and a Centre marked practical and theory assessments for the optional units. Assessment methods have been designed to assess the knowledge, understanding and skills of learners for all units.

The on-screen multiple choice examination is 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

This qualification is graded pass or refer.

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 learner will achieve a pass in their qualification.

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Structure

This qualification will be obtained by the learner once they have successfully completed the **two mandatory units** and **six optional units** from the units listed below.

The qualification has 78 credits and 600 Guided Learning Hours (GLH) and 780 hours Total Qualification Time (TQT).

Mandatory units:

Unit	Unit title	Credit	GLH	Ofqual Code
QETA/001	Engineering and Environmental Health and Safety	9	75	T/602/0551
QETA/002	Engineering Organisational Efficiency and Improvement	9	75	J/602/0554

Optional units - select six of the following units:

Unit	Unit title	Credit	GLH	Ofqual Code
QETA/003	Advanced Mathematics (for those wishing to enter HE)	10	75	R/602/0556
QETA/004	Advanced Electrical & Electronic Principles (for those wishing to enter HE)	10	75	Y/602/0557
QETA/005	Advanced Engineering Science (for those wishing to enter HE)	10	75	D/602/0558
QETA/006	Computer Aided Design (CAD) Techniques	10	75	H/602/0562
QETA/007	Computer Numerical Control (CNC) Programming/machining	10	75	Y/602/0560
QETA/008	Advanced Personal Computer (PC) Maintenance	10	75	H/602/0562
QETA/009	Electrical and Electronic Principles	10	75	K/602/0563
QETA/010	Programmable Logic Controllers (PLCs)	10	75	M/602/0564
QETA/011	Measurement Methods and Control Engineering	10	75	T/602/0565
QETA/012	Analogue Electronics	10	75	A/602/0566
QETA/013	Digital Electronics	10	75	F/602/0567

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Optional units *continued*

Unit	Unit title	Credit	GLH	Ofqual Code
QETA/014	Microelectronics	10	75	J/602/0571
QETA/015	Electrical Testing and Commissioning	10	75	R/602/0573
QETA/016	Fabrication and Welding Principles	10	75	K/602/0577
QETA/017	Pattern Development Methods	10	75	T/602/0579
QETA/018	Manual Metal-Arc (MMA) Welding	10	75	T/602/0582
QETA/019	Metal Inert Gas/Metal Active Gas (MIG/MAG) Welding	10	75	A/602/0583
QETA/020	Tungsten Inert Gas (TIG) Welding	10	75	F/602/0584
QETA/021	Mechanised Welding Processes	10	75	J/602/0585
QETA/022	Automated Welding Processes	10	75	L/602/0586
QETA/023	Producing Sheetmetal Fabrications	10	75	R/602/0587
QETA/023A	Sheet Metalwork Technology	10	75	L/506/7414
QETA/024	Producing Plate Fabrications	10	75	Y/602/0588
QETA/025	Producing Pipework Fabrications	10	75	D/602/0589
QETA/026	Managing Fabrication Activities	10	75	R/602/0590
QETA/027	Shipbuilding Operations	10	75	H/602/0593
QETA/028	Maintenance Engineering Principles	10	75	K/602/0594
QETA/029	Maintenance of Mechanical Systems	10	75	M/602/0595
QETA/030	General Engineering Maintenance Techniques	10	75	T/602/0596
QETA/031	Building Mechanical Maintenance Systems & Services	10	75	A/602/0597
QETA/032	Maintenance of Refrigeration Systems	10	75	F/602/0598
QETA/033	Maintenance of Fluid Power Systems and Components	10	75	J/602/0599
QETA/034	Maintenance of Hydraulic Systems and Components	10	75	M/602/0600

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Optional units *continued*

Unit	Unit title	Credit	GLH	Ofqual Code
QETA/035	Maintenance of Pneumatic Systems and Components	10	75	T/602/0601
QETA/036	Electrical Maintenance in Buildings	10	75	A/602/0602
QETA/037	Engineering Instrumentation	10	75	F/602/0603
QETA/038	Installation of Electrical Equipment	10	75	J/602/0604
QETA/039	Mechanical Engineering Principles	10	75	A/602/1152
QETA/040	Toolmaking/Presswork /Extrusion	10	75	F/602/2979
QETA/041	Advanced Manufacture Techniques - Computer Numerical Control (CNC)	10	75	A/602/2981
QETA/042	Engineering Inspection and Quality Control	10	75	F/602/1153
QETA/043	Engineering Design Process	10	75	J/602/1154
QETA/044	Precision Grinding	10	75	L/602/1155
QETA/045	Gear Cutting	10	75	R/602/1156
QETA/046	Advanced Milling	10	75	Y/602/1157
QETA/047	Advanced Turning	10	75	D/602/1158
QETA/048	Specialised Machining	10	75	H/602/1159
QETA/049	Advanced Manufacture Techniques – Computer Aided Manufacture (CAM)	10	75	Y/602/1160
QETA/050	Data Communication and Networking	10	75	D/602/1161
QETA/051	Fixed Wing Theory of Flight	10	75	H/602/1162
QETA/052	Principles of Rotorywing Aircraft Flight	10	75	K/602/1163
QETA/053	Rotorywing Aircraft Structures and Transmissions	10	75	M/602/1164
QETA/054	Rotorywing Aircraft Gas Turbine Engines	10	75	T/602/1165
QETA/055	Rotorywing Aircraft Systems	10	75	A/602/1166

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Optional units *continued*

Unit	Unit title	Credit	GLH	Ofqual Code
QETA/056	Mechanical Engineering Principles for Aircraft Technicians	10	75	F/602/1167
QETA/057	Radio and Radar Principles	10	75	J/602/1168
QETA/058	Servicing Cardiovascular Equipment	10	75	L/602/1169
QETA/059	Servicing Physiological Monitoring and Infusion Equipment	10	75	F/602/1170
QETA/060	Servicing Medical Therapeutic Equipment	10	75	J/602/1171
QETA/061	Analogue Systems Engineering	10	75	L/602/1172
QETA/062	Panel wiring for engineering applications	10	75	L/602/2984
QETA/063	Electrical Power for engineering applications	10	75	R/602/2985
QETA/064	Consumable Mould Casting Processes	10	75	J/502/9017
QETA/065	Permanent Mould Casting Processes	10	75	A/502/9029
QETA/066	Design for Casting	10	75	H/502/9056
QETA/067	Patternmaking	10	75	D/502/9069
QETA/068	Sand Moulding and Core Making	10	75	F/502/9078
QETA/069	Processing and Casting of Molten Metal	10	75	M/502/9089
QETA/070	Post Cast Operations	10	75	F/502/9095
QETA/071	Metallurgical Testing	10	75	Y/502/9104
QETA/076	Digital Systems	10	75	Y/503/8742
QETA/077	Workplace Improvement	10	75	R/503/8934
QETA/078	Aircraft maintenance and manufacturing engineering practices	10	75	H/504/3118
QETA/079	Manufacturing aircraft structures	10	75	K/504/3119
QETA/080	Assembling aircraft structures and components	10	75	T/504/3124

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Optional units *continued*

Unit	Unit title	Credit	GLH	Ofqual Code
QETA/081	Maintenance of Aircraft Structures	10	75	A/504/3125
QETA/089	Railway Infrastructure - Mechanical Engineering Principles	10	75	D/507/4223
QETA/090	Railway Infrastructure - Railway Civil Engineering	10	75	K/507/4225
QETA/091	Railway Infrastructure - Track Engineering	10	75	A/507/4228
QETA/092	Railway Infrastructure - Track Engineering Construction	10	75	F/507/4232
QETA/093	Railway Infrastructure - Track Engineering Maintenance	10	75	J/507/4233
QETA/094	Railway Infrastructure - Electrical Engineering	10	75	Y/507/4236
QETA/095	Railway infrastructure - Overhead Line Equipment Maintenance	10	75	H/507/4238
QETA/096	Railway infrastructure - Overhead Line Equipment Construction	10	75	K/507/4239
QETA/097	Rail Vehicle Traction Systems	10	75	H/507/4241
QETA/098	Traction and Rolling Suspension, Wheelsets, Brakes and Associated Systems	10	75	M/507/4243
QETA/099	Railway infrastructure - Function and characteristics of railway signalling systems	10	75	F/508/1133
QETA/100	Railway infrastructure - Railway signalling systems testing and maintenance	10	75	J/508/1134