Level 2 Diploma in

ENGINEERING

Advanced Manufacturing and Engineering (Foundation Competence)

www.eal.org.uk

Qualification Specification

Overview

This qualification covers specific skills knowledge and behaviours of a range of engineering disciplines which have been developed in consultation with engineering industry specialists and training providers to ensure that it meets the needs of employers and learners and covers a range of apprenticeship standards developed across the advanced manufacturing and engineering sector.

Typical Job

Mechatronic Maintenance Technician, Product Design and Development Technician/Engineer, Electrical/Electronic Support Engineer, Manufacturing Engineer, Machinist, Toolmaker/Tool and Die Maintenance technician.

Qualification code:	601/7179/0
Level:	2
Guided learning hours:	800
Total qualification time:	800 Hours
Minimum learning age:	16

Purpose of qualification

What is this qualification?
This qualification is a competency qualification which has been approved by the advanced manufacturing and engineering sector employer groups which is made up a range of employers, providers and professional institutions.

The qualification focuses on the skills, knowledge and behaviors required to achieve the foundation phase requirements of relevant apprenticeship standards. This arrangement ensures that when the learner completes the qualification they will have gained knowledge and practical experience of some of the situations that they could face within the occupational sector in which it is being delivered.

It covers specific skills knowledge and behaviors of a range of engineering disciplines which have been developed in consultation with engineering industry specialists and training providers to ensure that it meets the needs of industry employers and learners.

What does this qualification cover?
The content and structure of this qualification has been developed to provide the specific level of skills, knowledge and behaviors required to be achieved and assessed to demonstrate full occupational competence in the Foundation Phase of the apprenticeship.

This qualification is a level 2 Diploma and has a minimum of 800 Guided Learning Hours (GLH) and a Total Qualification Time (TQT) value of 800

Who is this qualification for?

- Learners who are working towards a relevant apprenticeship standard
- Learners who are looking to advance to the development phase of a relevant apprenticeship standard

Who supports the qualification?

This qualification is:

- Regulated by Ofqual at level 2
- Supported by SEMTA
- Supported by advanced manufacturing and engineering sector.

What could this qualification lead to?

Typical job roles include:

Mechatronic Maintenance Technician, Product Design and Development Technician/Engineer, Electrical/Electronic Support Engineer, Manufacturing Engineer, Machinist, Toolmaker/Tool and Die Maintenance technician. This qualification will provide progression onto other suitable and appropriate level 3 and level 4 engineering qualifications.

Entry requirements

Learners must be at least 16 years old. There are no formal entry requirements for this qualification; however centres should ensure that the learners have the potential to achieve this qualification. Learners must have the minimum levels of literacy and numeracy to complete the learning outcomes and the external assessment.

Centres should make learners with particular requirements aware of the content of the qualification and they should be given every opportunity to successfully complete the qualification. EAL will consider any reasonable suggestions for, and from, those with disabilities that would help them to achieve the learning outcomes without compromising the standards required.

How is the qualification achieved?

The qualification is achieved when all the necessary units have been completed. The centre will then be able to apply for the learner's certificate of achievement. The learners will also receive a certificate of unit credit, listing all the units they have achieved.

What will be assessed?

This qualification is gained when all the performance, skills knowledge and behaviours have been demonstrated across the assessment criteria for each unit selected.

The assessment criteria within the units of competence have been specifically developed to cover the base skills, knowledge and behaviours for a wide range of activities relevant to a range of roles that are available within the advanced manufacturing and engineering sector. The evidence produced for the units will, therefore, depend on the skills and knowledge required by employer and specified in the apprentices training plan.

Grading Criteria

This qualification is not graded, learners can achieve a pass or be refer only. To achieve a pass learners must be able to demonstrated their performance, skills, knowledge and behaviours across the units.

How will it be assessed?

Performance evidence must be a product of the Apprentices work, such as items that have been produced or worked on, plans, charts, reports, standard operating procedures, documents produced as part of a work activity, records or photographs of the completed activity

Together with evidence of the way the Apprentice carried out the activities, such as witness testimonies, assessor observations or authenticated Apprentice reports of the activity undertaken.

Knowledge and understanding are key components of competent performance, but it is unlikely that performance evidence alone will provide enough evidence in this area. Where the Apprentices knowledge and understanding is not apparent from performance evidence, it must be assessed by other means and be supported by suitable evidence.

Structure

This qualification can be obtained by the learner by completing all mandatory units plus a minimum of **six** optional units.

Mandatory Units: ***All four mandatory units must be completed***

EAL Code	Assessment Route Title	GL(hrs)	Ofqual Code
AUEC2-001	Complying with statutory regulations and organisational safety requirements	50	H/507/6927
AUEC2-002	Working efficiently and effectively in an engineering environment	50	K/507/6928
AUEC2-003	Using and communicating technical information	40	M/507/6929
	One of the following Units must be selected:		
AUEC2-004	Conducting business improvement activities	80	H/507/6930
AUEC2-004A	Demonstrating personal accountability in an engineering environment	80	D/617/0895

Optional Units: A minimum of six optional units must be completed from the following:

Note: the **six** optional units are a minimum requirement. Employers may require their learners to achieve more units in order to meet their specific apprenticeship standard and business needs. For guidance please see the employer recommended unit options in Appendix 2 of the EAL Qualification Manual - employer recommended unit options and combinations for specific apprenticeship standards.

AUEC2-005	Producing components using hand fitting techniques	140	K/507/6931
AUEC2-006	Maintaining mechanical devices and equipment	140	M/507/6932
AUEC2-007	Assembling and testing fluid power systems	140	T/507/6933
AUEC2-008	Maintaining fluid power equipment	140	A/507/6934
AUEC2-009	Maintaining electrical equipment/systems	150	F/507/6935
AUEC2-010	Wiring and testing electrical equipment and circuits	140	J/507/6936
AUEC2-011	Wiring and testing programmable controller based systems	150	L/507/6937
AUEC2-012	Producing mechanical assemblies	150	R/507/6938
AUEC2-013	Preparing and using lathes for turning operations	150	Y/507/6939
AUEC2-014	Preparing and using milling machines	150	L/507/6940
AUEC2-015	Preparing and using semi-automatic MIG, MAG and flux cored arc welding equipment	150	R/507/6941

Optional Units - Continued

EAL Code	Assessment Route Title	GL(hrs)	Ofqual Code
AUEC2-016	Assembling and testing electronic circuits	140	Y/507/6942
AUEC2-017	Maintaining electronic equipment/systems	150	D/507/6943
AUEC2-018	Preparing and using industrial robots	140	H/507/6944
AUEC2-019	General turning, milling and welding applications	180	K/507/6945
AUEC2-020	Forming and assembling pipework systems	140	M/507/6946
AUEC2-021	Preparing and proving CNC machine tool programs	140	T/507/6947
AUEC2-022	Producing sheet metal components and assemblies	140	A/507/6948
AUEC2-023	Maintaining and testing process instrumentation and control devices	150	F/507/6949
AUEC2-024	Producing components by rapid prototyping techniques	110	T/507/6950
AUEC2-025	Wiring and testing vehicle electrical equipment and circuits	140	A/507/6951
AUEC2-026	Maintaining vehicle electrical equipment/systems	150	F/507/6935
AUEC2-027	Diagnosing and rectifying faults on vehicle systems	150	J/507/6953
AUEC2-028	Stripping and rebuilding vehicle engines	140	L/507/6954
AUEC2-029	Using computer software packages to assist with engineering activities	80	R/507/6955
AUEC2-030	Producing CAD models (drawings) using a CAD system	110	Y/507/6956
AUEC2-031	Producing electrical or electronic engineering drawings using a CAD system	110	D/507/6957
AUEC2-032	Producing engineering project plans	80	H/507/6958
AUEC2-033	Preparing and Using Grinding Machines	150	F/508/4954
AUEC2-034	Preparing and Using CNC Turning Machines	140	F/508/4968
AUEC2-035	Preparing and Using CNC Milling Machines	140	J/508/4972
AUEC2-036	Preparing and Using CNC Machining Centres	140	R/508/4974
AUEC2-037	Carrying Out Heat Treatment of Engineering Materials	90	Y/508/4975
AUEC2-038	Producing Mechanical Engineering Drawings using a CAD System	110	D/508/4976

Optional Units - Continued

EAL Code	Assessment Route Title	GL(hrs)	Ofqual Code
AUEC2-039	Assembling, Wiring and Testing Electrical Panels/Components Mounted in Enclosures	140	H/508/4977
AUEC2-040	Forming and Assembling Electrical Cable Enclosure and Support Systems	130	M/508/4979
AUEC2-041	Preparing and Using Electro Discharge Machines	150	H/508/4980
AUEC2-042	Preparing and Using Manual TIG or Plasma-arc Welding Equipment	150	K/508/4981
AUEC2-043	Preparing and Using CNC Fabrication Equipment	140	M/508/4982
AUEC2-044	General Welding Applications	150	L/508/4987
AUEC2-045	Producing Tool and Die Assemblies	150	F/615/8397
AUEC2-046	Produce Composite Mouldings Using Pre-Preg Techniques	140	J/615/8398
AUEC2-047	Carrying Out Repairs on Composite Mouldings	140	T/615/8400
AUEC2-048	General Machining, Fitting and Assembly Applications	120	F/615/8402
AUEC2-049	General Fabrication and Welding Applications	120	J/615/8403
AUEC2-050	General Electrical and Electronic Engineering Applications	120	L/615/8404
AUEC2-051	General Maintenance Engineering Applications	120	R/615/8405
AUEC2-052	Carrying Aircraft Detail Fitting Activities	140	D/615/8407
AUEC2-053	Installing Aircraft Mechanical Fasteners	110	H/615/8408
AUEC2-067	Preparing and Using Manual Metal Arc Welding Equipment	150	F/617/0288
AUEC2-068	Preparing and Using Manual Oxy/fuel Gas Welding Equipment	140	J/617/0289
AUEC2-069	Preparing and Using Manual Flame Brazing and Braze Welding Equipment	110	A/617/0290
AUEC2-071	Producing Platework Components and Assemblies	140	J/617/0292
AUEC2-088	Slinging, lifting and moving materials and components	140	H/617/0896

Structure

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Optional unit selection requirements and barred combinations:

For centres who are delivering this qualification against the Level 3
Mechatronics Maintenance Technician and Level 3 Product Design and Development Technician Standards they will be required to select a minimum of three units from units: AUEC2-05, 06, 08, 09, 010, 011, 012, 013, 014, 016, 019, 021, 025 and 028 within the optional unit selection as these three units will be used for the Foundation Competence gateway assessment.

Only one of the three CAD units: AUEC2-030, 031 and AUEC2-038 may be undertaken as the apprentice's choice of optional units.
However they can be undertaken as additional units if required by the employer.

If either welding units: AUEC2-015, 042, 067, 068, 069 and 071 are selected then units AUEC-019, 043 or 049
cannot be undertaken as the apprentice's choice of optional units.
However, it can be undertaken as an additional unit if required by the employer.

Unit AUEC2 -019 cannot be undertaken if any of the following machining units have been undertaken as the apprentices' choice of optional units i.e. units AUEC2-013, 014, 034, 035, 036, 048.

Taking into account the barred combinations for the welding units, only one unit from unit AUEC2 -019, 043 or 049 can be selected as the apprentices' choice of optional units.

Only one of the following units AUEC2-012 or 045 may be undertaken as the apprentices' choice of optional units.
However they can be undertaken as additional units if required by the employer.

Only one of the following units AUEC2-05 or 052 may be undertaken as the apprentices' choice of optional units.
However they can be undertaken as additional units if required by the employer.

If unit AUEC2-48 is undertaken then Unit AUEC2-05, 012, 013, 014, 034, 035, 036, 045 or 052 cannot be undertaken as the apprentices' choice of optional units.
However it can be undertaken as an additional unit if required by the employer.

If unit AUEC2-049 is undertaken then unit AUEC2-015, 019, 022, 040, 042, 043 or 044 cannot be undertaken as the apprentices' choice of optional units.
However it can be undertaken as an additional unit if required by the employer.

If unit AUEC2- 050 is undertaken then Unit AUEC2 -010, 011, 016, 025 or 039 cannot be undertaken as the apprentices' choice of optional units.
However it can be undertaken as an additional unit if required by the employer.

If unit AUEC2-051 is undertaken then unit AUEC2 -06, 08, 09, 011, 017, 023, 026 or 027 cannot be undertaken as the apprentices' choice of optional units.
However it can be undertaken as an additional unit if required by the employer.