

Level 3 Diploma in Aviation Maintenance (Military Development Competence) (4608-60)

Version 3.0 (July 2019)

Qualification Handbook

Qualification at a glance

Subject area	Mechanical
City & Guilds number	4608
Age group approved	16-19, 19+
Entry requirements	None
Assessment types	Portfolio
Approvals	Automatic approval
Registration and certification	Consult the Walled Garden/Online Catalogue for last dates

Title and level	GLH	TQT	City & Guilds qualification number	Ofqual accreditation number
Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Avionic Maintenance	922	922	4608-60	603/2068/0
Level 3 Diploma in Aviation Maintenance (Military Development Competence) – Avionic Component Overhaul	278	446	4608-60	603/2068/0
Level 3 Diploma in Aviation Maintenance (Military Development Competence) – Aircraft Mechanical Maintenance	831	3329	4608-60	603/2068/0
Level 3 Diploma in Aviation Maintenance (Military Development Competence) – Aircraft Engine Overhaul	311	1540	4608-60	603/2068/0
Level 3 Diploma in Aviation Maintenance (Military Development Competence) – Aircraft Mechanical Component Overhaul	817	2710	4608-60	603/2068/0
Level 3 Diploma in Aviation Maintenance (Military Development Competence) – Weapons Overhaul	278	950	4608-60	603/2068/0
Level 3 Diploma in Aviation Maintenance (Military Development Competence) – Weapons Maintenance	593	2440	4608-60	603/2068/0
Level 3 Diploma in Aviation Maintenance (Military Development Competence) – Survival Equipment Maintenance	370	1510	4608-60	603/2068/0

Version and date	Change detail	Section
Version 2.0 August 2018	Additional Pathways added and separate Qualification handbook and unit packs made available	All
Version 2.1 October 2018	Pathway five renamed	All
Version 3.0 July 2019	Minor grammatical errors corrected. Footer corrected	All
Version 3.1 March 2022	GLH and TQT clarified and highlighted	Qualification at a Glance and Total qualification time

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1 Introduction

This document tells you what you need to do to deliver the qualification:

Area	Description
Who is the qualification for?	<p>It is aimed at anyone over the age of 16 who has an interest in working and progressing in the Aerospace and Aviation sector.</p> <p>It offers progression from Level 2 Diploma in Aerospace and Aviation Engineering (Military Foundation Competence).</p> <p>It is designed to train and qualify the next generation of Aviation maintenance technicians to meet an identified gap in the market and minimise the potential loss of skills and knowledge over the next 5-10 years.</p>
What does the qualification cover?	<p>This qualification allows learners to learn, develop and practice the skills required for employment and/or career progression in the Advanced Aviation Maintenance and Engineering sector in general.</p>
What opportunities for progression are there?	<p>This qualification will allow learners to access employment as Aircraft Maintenance Fitters/Technicians and provides a pathway into Higher Education.</p>
Who did we develop the qualification with?	<p>The Aerospace and Aviation Apprenticeship Employer Group which consists of the following organisations:</p> <ul style="list-style-type: none">- BAE Systems- Airbus- Gama Aviation- Harrods Aviation- Marshall ADG- Inflight MRO Services- Virgin- Rizon Jet UK- MOD <p>Professional Engineering Institutions and SEMTA.</p>
Is it part of an apprenticeship framework or initiative?	<p>Yes.</p>

Structures

For the **Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Avionic Maintenance**, Learners must complete 301, 302, 304, 354, 355, 455 plus two from 356– 366 and two from 367– 374.

For the **Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Avionic Component Overhaul**, Learners must complete 301, 302, 304 & 455 plus one from 413 – 422.

For the **Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Aircraft Mechanical Maintenance**, Learners must complete 301, 302, 304, 375, 376, 455 plus two from 377– 388 and plus two from 389– 396

For the **Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Aircraft Engine Overhaul**, Learners must complete 301, 302, 304, 455 plus two from 397– 406.

For the **Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Aircraft Mechanical Component Overhaul**, Learners must complete 301, 302, 304, 455 plus one from 407– 412.

For the **Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Weapons Overhaul**, Learners must complete 301, 302, 304, 455 plus one from 423–425, 456.

For the **Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Weapons Maintenance**, Learners must complete 301, 302, 304, 455, plus two from 426 432, plus one from 433– 436 and one from 437–440.

For the **Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Survival Equipment Maintenance**, Learners must complete 301, 302, 304, 455, plus five from 441– 454.

Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Avionic Maintenance

City & Guilds unit number	Unit title	GLH
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Mandatory

301	Complying with statutory regulations and organisational safety requirements	35
302	Using and interpreting engineering data and documentation	25
304	Reinstating the work area on completion of activities	25
354	Carrying out fault diagnosis on aircraft avionics components or systems	126
355	Undertaking scheduled maintenance of aircraft avionics equipment/systems	98
455	Working efficiently and effectively in engineering	25

Optional

356	Removing and replacing avionic indication and gauging components in aircraft systems	175
357	Removing and replacing components of aircraft electrical power control, distribution and protection	175
358	Removing and replacing components of aircraft pitot static systems	175
359	Removing and replacing components of aircraft armament systems	175
360	Removing and replacing components of aircraft communication systems	175
361	Removing and replacing components of aircraft passive warning and optical/surveillance systems	175
362	Removing and replacing components of aircraft radar systems	175
363	Removing and replacing components of aircraft navigational and computing systems	175
364	Removing and replacing components of aircraft flight guidance and control systems	175
365	Removing and replacing components of aircraft internal and external lighting systems	175
366	Modifying aircraft avionic systems	175
367	Carrying out tests on avionic indication and gauging components of aircraft systems	119

Optional

368	Carrying out tests on aircraft electrical power control, distribution and protection systems	119
369	Carrying out tests on aircraft pitot static systems	119
370	Carrying out tests on aircraft communication systems	119
371	Carrying out tests on aircraft passive warning and optical/surveillance systems	119
372	Carrying out tests on aircraft radar systems	119
373	Carrying out tests on aircraft navigational and computing systems	119
374	Carrying out tests on aircraft flight guidance and control systems	119

Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Avionic Component Overhaul

City & Guilds unit number	Unit title	GLH
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Mandatory

301	Complying with statutory regulations and organisational safety requirements	35
302	Using and interpreting engineering data and documentation	25
304	Reinstating the work area on completion of activities	25
455	Working efficiently and effectively in engineering	25

Optional

413	Overhauling components of aircraft navigational and computing equipment	336
414	Overhauling components of aircraft communication equipment	336
415	Overhauling components of aircraft radar equipment	336
416	Overhauling components of aircraft indication and gauging equipment	336
417	Overhauling components of aircraft electrical equipment	336
418	Overhauling components of aircraft pitot static equipment	336
419	Overhauling components of aircraft passive warning and optical/surveillance systems	336
420	Overhauling components of aircraft flight guidance and control equipment	336
421	Overhauling components of aircraft internal and external lighting equipment	336
422	Overhauling components of aircraft avionic equipment	336

Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Aircraft Mechanical Maintenance

City & Guilds unit number	Unit title	GLH
Mandatory		
301	Complying with statutory regulations and organisational safety requirements	35
302	Using and interpreting engineering data and documentation	25
304	Reinstating the work area on completion of activities	25
375	Carrying out fault diagnosis on aircraft airframe, mechanical components and systems	119
376	Undertaking scheduled maintenance of aircraft airframe and mechanical equipment	91
455	Working efficiently and effectively in engineering	25

Optional

377	Repairing airframes and structures	133
378	Modifying airframes	126
379	Removing and replacing aircraft power plant and components	175
380	Removing and replacing components of aircraft control systems	175
381	Removing and replacing components of aircraft fuel and lubrication systems	175
382	Removing and replacing components of aircraft hydraulic systems	175
383	Removing and replacing components of aircraft pneumatic and vacuum systems	175
384	Removing and replacing components of aircraft environmental systems	175
385	Removing and replacing components of aircraft power transmission systems	175
386	Removing and replacing components of aircraft cabin systems	161
387	Removing and replacing major assemblies of aircraft airframes	175
388	Modifying aircraft propulsion equipment and systems	175
389	Carrying out tests on aircraft engines and systems	133
390	Carrying out tests on aircraft control systems	126
391	Carrying out tests on aircraft fuel and storage systems	133
392	Carrying out tests on aircraft hydraulic systems	133
393	Carrying out tests on aircraft pneumatic and vacuum systems	133
394	Carrying out tests on aircraft environmental systems	133
395	Carrying out tests on aircraft power transmission systems	133
396	Carrying out checks and tests on replaced airframe major assemblies	126

Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Aircraft Engine Overhaul

City & Guilds unit number	Unit title	GLH
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Mandatory

301	Complying with statutory regulations and organisational safety requirements	35
302	Using and interpreting engineering data and documentation	25
304	Reinstating the work area on completion of activities	25
455	Working efficiently and effectively in engineering	25

Optional

397	Dressing Aircraft Engines	133
398	Carrying out test bed runs on aircraft engines (uninstalled)	357
399	Overhauling aircraft gas turbine engines by module replacement	357
400	Overhauling aircraft gas turbine engine compressor assemblies	322
401	Overhauling aircraft gas turbine engine combustion assemblies	357
402	Overhauling aircraft gas turbine engine turbine assemblies	315
403	Overhauling aircraft gas turbine engine gearbox assemblies	315
404	Overhauling aircraft piston engines	315
405	Dismantling aircraft gas turbine engines to module/unit level	168
406	Rebuilding aircraft gas turbine engines assemblies after overhaul	357

Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Aircraft Mechanical Component Overhaul

City & Guilds unit number	Unit title	GLH
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Mandatory

301	Complying with statutory regulations and organisational safety requirements	35
302	Using and interpreting engineering data and documentation	25
304	Reinstating the work area on completion of activities	25
455	Working efficiently and effectively in engineering	25

Optional

407	Overhauling components of aircraft rotor heads and power transmission equipment	371
408	Overhauling components of aircraft hydraulic equipment	371
409	Overhauling components of aircraft pneumatic, vacuum and environmental equipment	371
410	Overhauling components of aircraft oxygen equipment	371
411	Overhauling components of aircraft fuel and lubrication equipment	371
412	Overhauling major components of aircraft airframes	336

Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Weapons Overhaul

City & Guilds unit number	Unit title	GLH
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Mandatory

301	Complying with statutory regulations and organisational safety requirements	35
302	Using and interpreting engineering data and documentation	25
304	Reinstating the work area on completion of activities	25
455	Working efficiently and effectively in engineering	25

Optional

423	Overhauling aircraft gun systems	168
424	Overhauling aircraft assisted escape systems (AAES)	168
425	Overhauling aircraft armament release systems	168
456	ESA engineering operations	168

Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Weapons Maintenance

City & Guilds unit number	Unit title	GLH
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Mandatory

301	Complying with statutory regulations and organisational safety requirements	35
302	Using and interpreting engineering data and documentation	25
304	Reinstating the work area on completion of activities	25
455	Working efficiently and effectively in engineering	25

Optional

426	Testing uninstalled aircraft assisted escape system (AAES) components	126
427	Testing installed aircraft armament systems and role equipment	126
428	Testing uninstalled aircraft armament system components and role equipment	126
429	Undertaking fault diagnosis on installed aircraft armament systems and role equipment	105
430	Undertaking fault diagnosis on uninstalled aircraft armament system and role equipment components	105
431	Modifying aircraft armament systems and role equipment components	105
432	Testing installed aircraft assisted escape systems (AAES)	126
433	Removing aircraft armament system components and role equipment	105
434	Removing aircraft assisted escape systems (AAES)	105
435	Removing aircraft expendable stores	126
436	Dismantling aircraft expendable stores	126
437	Installing aircraft armament system components and role equipment	168
438	Installing aircraft assisted escape systems (AAES)	168
439	Installing aircraft armament expendable stores	168
440	Assembling aircraft expendable stores	168

Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Survival Equipment Maintenance

City & Guilds unit number	Unit title	GLH
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Mandatory

301	Complying with statutory regulations and organisational safety requirements	35
302	Using and interpreting engineering data and documentation	25
304	Reinstating the work area on completion of activities	25
455	Working efficiently and effectively in engineering	25

Optional

441	Carrying out maintenance of aircrew protective helmets and electrical headsets	52
442	Carrying out maintenance of aircrew protective clothing	52
443	Carrying out maintenance of aircrew nuclear, biological and chemical (NBC) respirators and equipment	52
444	Carrying out maintenance of aircrew life preserver equipment	52
445	Carrying out maintenance of aircrew inertia reels and restraint harnesses	52
446	Carrying out maintenance of aircraft multi-seat life rafts and emergency packs	52
447	Carrying out maintenance of aircrew oxygen masks	52
448	Carrying out maintenance of aircrew personal survival packs (PSP)	52
449	Carrying out maintenance of aircrew quick-release fasteners (QRF)	52
450	Carrying out maintenance of ejection seat headbox parachute assemblies	52
451	Carrying out maintenance of free fall parachute assemblies	52
452	Carrying out maintenance of static line parachute assemblies	52
453	Carrying out maintenance of brake parachute assemblies	52
454	Carrying out maintenance of night vision goggles	52

Total Qualification Time

Total Qualification Time (TQT) is the number of notional hours, which represents an estimate of the total amount of time that could reasonably be expected for a learner to achieve and demonstrate the achievement of the level of attainment necessary for the award of a qualification.

TQT is comprised of the following two elements:

- 1) The number of hours which an awarding organisation has assigned to a qualification for Guided Learning, and
- 2) an estimate of the number of hours a Learner will reasonably be likely to spend in preparation, study or any other form of participation in education or training, including assessment, which takes place as directed by - but, unlike Guided Learning, not under the Immediate Guidance or Supervision of - a lecturer, supervisor, tutor or other, appropriate provider of education or training.

Title and level	GLH	TQT
Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Avionic Maintenance	922	922
Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Avionic Component Overhaul	278	446
Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Aircraft Mechanical Maintenance	831	3329
Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Aircraft Engine Overhaul	311	1540
Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Aircraft Mechanical Component Overhaul	817	2710
Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Weapons Overhaul	278	950
Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Weapons Maintenance	593	2440
Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Survival Equipment Maintenance	370	1510

2 Centre requirements

Approval

If your centre is approved to offer the qualification Level 3 NVQ Diploma in Aeronautical Engineering then you can apply for automatic approval for the new Level 3 Diploma in Aviation Maintenance (Military Development Competence).

To offer these qualifications, new centres will need to gain both centre and qualification approval. Please refer to the Centre Manual - Supporting Customer Excellence for further information.

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualifications before designing a course programme.

Resource requirements

Centre staffing

Staff delivering these qualifications must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be occupationally competent or technically knowledgeable in the areas for which they are delivering training and/or have experience of providing training. This knowledge must be to the same level as the training being delivered
- have recent relevant experience in the specific area they will be assessing
- have credible experience of providing training.

Centre staff may undertake more than one role, eg tutor and assessor or internal verifier, but cannot internally verify their own assessments.

Learner entry requirements

City & Guilds does not set entry requirements for these qualifications. However, centres must ensure that candidates have the potential and opportunity to gain the qualifications successfully.

Individual employers will set the criteria, but most candidates will have four GCSEs at grade C (or equivalent) or above on entry (including English, Maths & Science). Employers who recruit learners without English, Maths and Science at Grade C or above, must ensure that the learner achieves this requirement, or an equivalent Level 2, prior to completion of the Apprenticeship.

This qualification is a mandatory component of the Development Phase of the following Apprenticeship Standard:

- Aircraft Maintenance Fitter/Technician (Fixed and Rotary Wing)

The Standard has been designed by Employers. Centres should make themselves familiar with the Standard, Assessment Plan and Employer Occupational Brief requirements, details of which can be found at: <https://www.gov.uk/government/collections/apprenticeship-standards>

Age restrictions

City & Guilds cannot accept any registrations for learners under 16 as these qualifications are not approved for learners under 16.

3 Delivering the qualification

Initial assessment and induction

An initial assessment of each candidate should be made before the start of their programme to identify:

- if the candidate has any specific training needs
- support and guidance they may need when working towards their qualifications
- any units they have already completed, or credit they have accumulated which is relevant to the qualifications
- the appropriate type and level of qualification.

We recommend that centres provide an induction programme so the learner fully understands the requirements of the qualification, their responsibilities as a learner, and the responsibilities of the centre. This information can be recorded on a learning contract.

Support materials

Recording documents

Candidates and centres may decide to use a paper-based or electronic method of recording evidence.

City & Guilds endorses several ePortfolio systems, including our own, Learning Assistant, an easy-to-use and secure online tool to support and evidence learners' progress towards achieving qualifications. Further details are available at: www.cityandguilds.com/eportfolios.

City & Guilds has developed a set of *recording forms* including examples of completed forms, for new and existing centres to use as appropriate. Recording forms are available on the City & Guilds website.

Although new centres are expected to use these forms, centres may devise or customise alternative forms, which must be approved for use by the external verifier, before they are used by candidates and assessors at the centre. Amendable (MS Word) versions of the forms are available on the City & Guilds website.

Pathway units documentation

The units specific to the pathways can be found in separate unit packs at www.cityandguilds.com

4 Assessment

Summary of assessment methods

Candidates must:

- have a completed portfolio of evidence for each unit

Assessment strategy

Access to assessment

There are no entry requirements required for the Units of Competence unless this is a legal requirement of the process or the environment in which the Apprentice is working in. Assessment is open to any Apprentice who has the potential to reach the assessment requirements set out in the relevant units.

Aids or appliances, which are designed to alleviate disability, may be used during assessment, providing they do not compromise the standard required.

Carrying out assessments

The Units of Competence have been specifically developed to cover a wide range of activities. The evidence produced for the units will, therefore, depend on the skills and knowledge required by employer and specified in the Apprentice's Training Plan. The Skills section of the Units of Competence makes reference to a number of optional items listed (for example 'any three from five'). This is the minimum standard set by employers.

Where the unit requirements gives a choice of optional areas, Assessors should note that Apprentices do not need to provide evidence of the other areas to complete the unit, unless specified by the employer (in this example above, two items) particularly where these additional items may relate to other activities or methods that are not part of the Apprentice's normal workplace activities or required by the employer.

Performance evidence requirements

Performance evidence must be the main form of evidence gathered. In order to demonstrate consistent competent performance for a unit, a minimum of three different examples of performance of the unit activity will be required. Items of performance evidence often contain features that apply to more than one unit, and can be used as evidence in any unit where they are suitable.

Performance evidence must be:

- products of the Apprentice's 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.

Competent performance is more than just carrying out a series of individual set tasks. Many of the units in the Development Phase contain statements that require the Apprentice to provide evidence that proves they are capable of combining various features and techniques. Where this is the case, separate fragments of evidence would not provide this combination of features and techniques and, therefore, will not be acceptable as demonstrating competent

performance.

If there is any doubt as to what constitutes suitable evidence the Internal/External Quality Assurer should be consulted.

Assessing knowledge and understanding requirements

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 Apprentice's knowledge and understanding is not apparent from performance evidence, it must be assessed by other means and be supported by suitable evidence.

Knowledge and understanding can be demonstrated in a number of different ways. It is recommended that oral questioning and practical demonstrations are used perhaps whilst observing the apprentice undertake specific tasks, as these are considered the most appropriate for these units. Assessors should ask enough questions to make sure that the Apprentice has an appropriate level of knowledge and understanding, as required by the unit.

Evidence of knowledge and understanding will **not** be required for those items in the skills section of the Units of Competence that have not been selected by the employer.

Where oral questioning is used the assessor must retain a record of the questions asked, together with the Apprentice's answers.

Witness testimony

Where observation is used to obtain performance evidence, this must be carried out against the unit assessment criteria. Best practice would require that such observation is carried out by a qualified assessor. If this is not practicable, then alternative sources of evidence may be used.

For example, the observation may be carried out against the assessment criteria by someone else that is in close contact with the Apprentice. This could be a team leader, supervisor, mentor or line manager who may be regarded as a suitable witness to the Apprentice's competency. However, the witness must be technically competent in the process or skills that they are providing testimony for, to at least the same level of expertise as that required of the Apprentice. It will be the responsibility of the assessor to make sure that any witness testimonies accepted as evidence of the Apprentice's competency are reliable, auditable and technically valid.

Maximising opportunities to use assessment evidence

One of the critical factors required in order to make this Assessment Strategy as efficient and effective as possible and to ease the burden of assessment, is the Assessor's ability and expertise to work in partnership with the apprentice and their employer to provide advice and guidance on how to maximise opportunities to cross reference performance and knowledge evidence to all relevant Units of Competence. For example if a knowledge statement is repeated in a number of separate Units of Competence and the expected evidence/response to that statement is the same including the context, then the same piece of evidence should be cross referenced to the appropriate units.

Recognition of prior learning (RPL)

Recognition of prior learning means using a person's previous experience, or qualifications which have already been achieved, to contribute to a new qualification.

For this qualification, RPL is allowed and is not sector specific.

5 Units

Structure of the units

These units each have the following:

- City & Guilds reference number
- Title
- Guided learning hours (GLH)
- Learning outcomes, which are comprised of a number of assessment criteria

Centres must deliver the full breadth of the range. Specialist equipment or commodities may not be available to all centres, so centres should ensure that their delivery covers their use. This may be covered by a practical demonstration (e.g. video). For the practical assessments for this qualification, centres should ensure that there are sufficient resources to complete the task but are not required to use all the equipment or commodities in the range.

You will find the mandatory units in this handbook and all pathway relevant units in separate unit packs.

Unit aim

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to deal with statutory regulations and organisational safety requirements, in accordance with approved procedures.

They will be required to comply with all relevant regulations that apply to their area of work as well as their general responsibilities as defined in the Health and Safety at Work Act.

They must also be able to identify the relevant qualified first aiders or appointed person, and know the location of the first aid facilities.

They will have an understanding of the procedures to be adopted in the case of accidents involving injury and in situations where there are dangerous occurrences or hazardous malfunctions of equipment, processes or machinery. They will also need to be fully conversant with the organisation's procedures for fire alerts and the evacuation of premises. They will be required to identify the hazards and risks that are associated with their job.

Typically, these will focus on their working environment, the tools and equipment that they use, materials and substances that they use, working practices that do not follow laid down procedures, and manual lifting and carrying techniques. Their responsibilities will require them to comply with organisational policy and procedures for the statutory regulations and organisational safety activities undertaken, and to report any problems with the safety activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people.

They will be expected to work with minimal supervision, taking personal responsibility for their own actions, and for the way in which they carry out the required manufacturing/engineering activities. Their underpinning knowledge will provide a good understanding of their work, and will provide an informed approach to applying statutory regulations and organisational safety requirements and procedures.

They will understand the safety requirements and their application, and will know about the safety requirements in adequate depth to provide a sound basis for carrying out the activities safely and correctly.

They will be able to apply the occupational behaviours required in the workplace to meet the job profile and overall company objectives, including being able to demonstrate; personal responsibility and resilience, working effectively in teams, effective communication and interpersonal skills, focus on quality and problem solving and continuous development.

Learning outcome

P Performance requirements

Assessment criteria

The learner can:

- P1 comply with their duties and obligations as defined in the Health and Safety at Work Act
- P2 demonstrate the required occupational behaviours in line with the job role and company objectives
- P3 present themselves in the workplace suitably prepared for the activities to be undertaken
- P4 follow organisational accident and emergency procedures
- P5 recognise and control hazards in the workplace
- P6 use correct manual lifting and carrying techniques
- P7 apply safe working practices and procedures

Learning outcome

The learner will:

- 1 demonstrate their understanding of their duties and obligations to health and safety by carrying out **all** of the following:
 - 1.1 apply in principle their duties and responsibilities as an individual under the Health and Safety at Work Act and relevant current legislation
 - 1.2 identifying within their organisation, appropriate sources of information and guidance on health and safety issues, to include:
 - i) eye protection and personal protective equipment
 - ii) COSHH regulations
 - iii) risk assessments
 - 1.3 identifying the warning signs and labels of the main groups of hazardous or dangerous substances
 - 1.4 complying with the appropriate statutory regulations at all times.

Learning outcome

The learner will:

- 2 comply with **all** emergency requirements, to include:
 - 2.1 identifying the appropriate qualified first aiders or appointed person and the location of first aid facilities
 - 2.2 identifying the procedures to be followed in the event of injury to self or others
 - 2.3 following organisational procedures in the event of fire and the evacuation of premises
 - 2.4 identifying the procedures to be followed in the event of dangerous occurrences or hazardous malfunctions.

Learning outcome

The learner will:

- 3 identify hazards and risks associated with **all** of the following:

Assessment criteria

- 3.1 their working environment
- 3.2 the tools and equipment that they use
- 3.3 materials and substances that they use
- 3.4 using working practices that do not follow laid down procedures.

Learning outcome

The learner will:

- 4 demonstrate **two** of the following methods of manual lifting and carrying techniques:
 - 4.1 lifting alone
 - 4.2 with assistance of others
 - 4.3 with mechanical assistance.

Learning outcome

The learner will:

- 5 apply safe working practices in an industrial environment, to include **all** of the following:
 - 5.1 maintaining a tidy workplace with exits and gangways free from obstructions
 - 5.2 using tools and equipment safely and only for the purpose intended
 - 5.3 observing organisational safety rules, signs and hazard warnings
 - 5.4 taking measures to protect others from harm by any work they are carrying out.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

- K1 describe the roles and responsibilities of themselves and others under the Health and Safety at Work Act 1974 and current legislation (such as The Management of Health and Safety at Work Regulations; Workplace Health and Safety and Welfare Regulations; Personal Protective Equipment at Work Regulations 1992; Manual Handling Operations Regulations; Provision and Use of Work Equipment Regulations; Display Screen at Work Regulations; The Electricity at Work Regulations)
- K2 describe the specific regulations and safe working practices and procedures that apply to their work activities
- K3 describe the warning signs for the nine main groups of hazardous substances defined by Classification, Packaging and Labelling of Dangerous Substances Regulations
- K4 explain how to locate relevant health and safety information for their tasks and the sources of expert assistance when help is needed
- K5 explain what constitutes a hazard in the workplace (such as moving parts of machinery, electricity, slippery and uneven surfaces, dust and fumes, handling and transporting, contaminants and irritants, material ejection, fire, working at height, environment, pressure/stored energy systems, volatile or toxic materials, unshielded processes)
- K6 describe their responsibilities for dealing with hazards and reducing risks in the workplace (such as hazard spotting and safety inspections; the use of hazard check lists, carrying out risk assessments, COSHH assessments and safe systems of working)
- K7 describe the risks associated with their working environment, the tools, materials and equipment that they use, spillages of oil and chemicals, not reporting accidental breakages of tools or equipment and not following laid-down working practices and procedures
- K8 describe the importance of applying the appropriate occupational behaviours in the workplace and the implications for both the apprentice and the business if these are not adhered to
- K9 describe first aid facilities that exist within their work area and within the organisation in general and the procedures to be followed in the case of accidents involving injury
- K10 explain what constitutes dangerous occurrences and hazardous malfunctions, and why these must be reported even when no one was injured
- K11 describe the procedures for sounding the emergency alarms, evacuation procedures and escape routes to be used and the need to report their presence at the appropriate assembly point
- K12 describe the organisational policy with regard to firefighting procedures, the common causes of fire and what they can do to help prevent them
- K13 describe the protective clothing and equipment that is available for their areas of activity
- K14 explain how to lift and carry loads safely, and the manual and mechanical aids available

- K15 explain how to prepare and maintain safe working areas, standards and procedures to ensure good housekeeping
- K16 describe the importance of safe storage of tools, equipment, materials and products
- K17 describe the extent of their own authority and to whom they should report in the event of problems that they cannot resolve.

Unit 301

Complying with statutory regulations and organisational safety requirements

Supporting Information

Assessment Requirements

Assessment requirements have been developed by employers for the occupational competency units and qualifications for Advanced Manufacturing and Engineering Sector. These assessment requirements are set out in the relevant Qualification Assessment Strategy available from Semta. Please contact Customer.Services@semta.org.uk quoting Advanced Manufacturing and Engineering Qualification Assessment Strategy and specify the title of the relevant Trailblazer Standard.

Although all of the content and assessment requirements must be met in full employers can tailor the training outcomes to ensure that the content of the programme is specific to their requirements in terms of products, processes, procedures, tools, equipment, materials, documentation and information systems.

This will allow each organisation to develop their own specific and tailored apprentice training programme whilst meeting their own requirements whilst at the same time ensuring that the overall generic content is to a high standard in terms of depth and breadth to enable progression and/or transferability to other employers.

Unit aim

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to make effective use of text, numeric and graphical information by interpreting and using technical information extracted from engineering drawings, technical manuals, reference tables, specifications and charts, in accordance with approved procedures. They will be required to extract the necessary information from the various drawings and related documents in order to establish and carry out the maintenance requirements and to make valid decisions about the quality and accuracy of the equipment being maintained.

Their responsibilities will require them to comply with organisational policy and procedures for obtaining and using the drawings and related specifications. They will be expected to report any problems with the use and interpretation of the drawings and specifications that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They will be expected to work with minimal supervision, taking personal responsibility for their own actions, and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide a good understanding of the types of drawings and documents used within a maintenance environment, and will provide an informed approach to applying instructions and procedures. They will be able to read and interpret the drawings and documents used and will know about the conventions, symbols and abbreviations, in adequate depth to provide a sound basis for carrying out the maintenance activities to the required specification.

They will be able to apply the occupational behaviours required in the workplace to meet the job profile and overall company objectives, including being able to demonstrate; personal responsibility and resilience, working effectively in teams, effective communication and interpersonal skills, focus on quality and problem solving and continuous development.

Learning outcome

P Performance requirements

Assessment criteria

The learner can:

- P1 use the approved source to obtain the required data, documentation or specifications
- P2 demonstrate the required occupational behaviours in line with the job role and company objectives
- P3 extract and interpret the required information from the data, documentation or specifications
- P4 use the information obtained to establish work requirements
- P5 deal promptly and effectively with any problems within their control and report those which cannot be solved
- P6 record and/or communicate technical data and information using approved methods
- P7 report any inaccuracies or discrepancies in drawings and specifications
- P8 use the approved source to obtain the required data, documentation or specifications.

Learning outcome

The learner will:

- 1 use approved sources to obtain the necessary drawings and related specifications, and carry out **all** of the following:
 - 1.1 check the currency and validity of the documentation used
 - 1.2 exercise care and control over the documentation at all times
 - 1.3 correctly extract all necessary data in order to carry out the required tasks
 - 1.4 seek out additional information where there are gaps or deficiencies in the information obtained
 - 1.5 deal with and/or report any problems found with the data and documentation
 - 1.6 make valid decisions based on the evaluation of the information extracted from the documentation
 - 1.7 return all documentation to the approved location on completion of the work
 - 1.8 complete all necessary work related documentation such as production documentation, installation documentation, maintenance documentation, planning documentation.

Learning outcome

The learner will:

- 2 use information extracted from engineering drawings and related documentation, to include **two** of the following:
 - 2.1 drawings (such as component drawings, general assembly drawings, modification drawings, repair drawings, welding/fabrication drawings, distribution and installation drawings)
 - 2.2 diagrams (such as schematic, fluid power diagrams, piping, wiring/circuit, layout diagrams)
 - 2.3 manufacturers' manuals/drawings
 - 2.4 approved sketches
 - 2.5 technical illustrations
 - 2.6 photographic images/representations
 - 2.7 visual display screen information
 - 2.8 technical sales/marketing documentation
 - 2.9 contractual documentation
 - 2.10 other specific drawings/documents.

Learning outcome

The learner will:

- 3 use information extracted from related documentation to include **three** from the following:
 - 3.1 standard operating procedures
 - 3.2 instructions (such as job instructions, drawing instructions, manufacturers' instructions)
 - 3.3 specifications (such as material, finish, process, contractual, calibration)
 - 3.4 reference materials (such as manuals, tables, charts, fault diagnosis guides)
 - 3.5 schedules
 - 3.6 operation sheets
 - 3.7 maintenance log reports
 - 3.8 service/test information/schedules/results
 - 3.9 planning documentation
 - 3.10 quality control documents
 - 3.11 company specific technical instructions
 - 3.12 national, international and organisational standards
 - 3.13 health and safety standards relating to the activity (such as COSHH)
 - 3.14 environmental requirements/information
 - 3.15 other specific related documentation.

Learning outcome

The learner will:

- 4 extract information that includes **three** of the following:
 - 4.1 materials or components required
 - 4.2 dimensions
 - 4.3 tolerances
 - 4.4 quality requirements
 - 4.5 installation requirements
 - 4.6 customer requirements
 - 4.7 time scales
 - 4.8 financial information
 - 4.9 operating parameters
 - 4.10 surface texture requirements
 - 4.11 location/orientation of parts
 - 4.12 process or treatments required
 - 4.13 dismantling/assembly sequence
 - 4.14 inspection/testing requirements
 - 4.15 number/volumes required
 - 4.16 repair/service methods
 - 4.17 method of manufacture
 - 4.18 weld type and size
 - 4.19 operations required
 - 4.20 connections to be made
 - 4.21 surface finish required
 - 4.22 shape or profiles
 - 4.23 fault finding procedures
 - 4.24 test points
 - 4.25 safety/risk factors
 - 4.26 environmental controls
 - 4.27 technical data (such as component data, maintenance data, electrical data, fluid data)
 - 4.28 resources (such as tools, equipment, personnel)
 - 4.29 utility supply details (such as electricity, water, gas, air)
 - 4.30 location of services, including standby and emergency backup systems
 - 4.31 circuit characteristics (such as pressure, flow, current, voltage, speed)
 - 4.32 protective arrangements and equipment (such as containment, environmental controls, warning and evacuation systems and equipment)
 - 4.33 other specific related information (such as financial delivery or contractual data).

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

- K1 explain what information sources are used for the documentation and specifications that they use in their work activities
- K2 explain how the required documentation is obtained, and how to check that it is current and valid
- K3 explain the importance of applying the appropriate occupational behaviours in the workplace and the implications for both the apprentice and the business if these are not adhered to
- K4 explain how to use other sources of information to support the activity (such as manuals, tables, charts, planning and quality documentation, national and international standards)
- K5 describe the procedure for reporting discrepancies, lost or damaged documentation
- K6 explain the care and control procedures for the documentation, and the importance of returning them to the designated location on completion of the work activities
- K7 explain what basic drawing conventions are used, and why there needs to be different types of drawings
- K8 explain what types of drawings/diagrams used, and how they interrelate (such as isometric and orthographic, first and third angle, assembly drawings, circuit and wiring diagrams, block and schematic diagrams)
- K9 explain why technical information is presented in different forms
- K10 explain the meaning of common symbols and abbreviations used within the working environment/work area
- K11 explain the imperial and metric systems of measurement, tolerancing and fixed reference points
- K12 describe the meaning of the different symbols and abbreviations found on the documentation that they use (such as wiring and component symbols, surface finish, electronic components, weld symbols, linear and geometric tolerances, pressure and flow characteristics)
- K13 describe the extent of their own responsibility, when to act on their own initiative to find, clarify and evaluate information, and to whom they should report if they have problems that they cannot resolve.

Unit 302

Using and interpreting engineering data and documentation

Supporting Information

Assessment Requirements

Assessment requirements have been developed by employers for the occupational competency units and qualifications for Advanced Manufacturing and Engineering Sector. These assessment requirements are set out in the relevant Qualification Assessment Strategy available from Semta. Please contact Customer.Services@semta.org.uk quoting Advanced Manufacturing and Engineering Qualification Assessment Strategy and specify the title of the relevant Trailblazer Standard.

Although all of the content and assessment requirements must be met in full employers can tailor the training outcomes to ensure that the content of the programme is specific to their requirements in terms of products, processes, procedures, tools, equipment, materials, documentation and information systems.

This will allow each organisation to develop their own specific and tailored apprentice training programme whilst meeting their own requirements whilst at the same time ensuring that the overall generic content is to a high standard in terms of depth and breadth to enable progression and/or transferability to other employers.

Unit aim

This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to reinstate the work area, in accordance with approved procedures. They will be required to follow the correct procedures for the safe storage of finished products and surplus materials and to correctly identify and separate all waste materials and ensure that they are removed to their designated locations. They will also need to ensure that all tools, equipment and documents used are accounted for and returned to the appropriate places. Tidying of the work area will be of prime importance and includes office and clean working area environments, workshops, staging and platforms, internal areas of aircraft such as wings, tanks and fuselage sections and areas that are airside.

Their responsibilities will require them to comply with organisational policy and procedures for the activities undertaken and to report any problems with the reinstatement activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality of the work they carry out.

Their underpinning knowledge will provide a good understanding of their work and provide an informed approach to applying the required procedures. They will understand the need for reinstating the work areas and will know about the storage requirements of the products, equipment, materials, documentation and consumables, in adequate depth to provide a sound basis for carrying out the activities to the required standard and ensuring that the work area is reinstated satisfactorily. They will understand the safety precautions required when reinstating the work area. They will be required to demonstrate safe working practices throughout and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

P Performance requirements

Assessment criteria

The learner can:

- P1 work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
- P2 demonstrate the required behaviours in line with the job role and company objectives
- P3 separate equipment, components and materials for re-use from waste items and materials
- P4 store reusable materials and equipment in an appropriate location
- P5 dispose of waste materials in line with organisational and environmental safe procedures
- P6 restore the work areas to a safe condition in accordance with agreed requirements and schedules
- P7 deal promptly and effectively with problems within their control and report those that cannot be solved.

Learning outcome

The learner will:

- 1 carry out **all** of the following activities during reinstatement of the work area:
 - 1.1 work to current schedules
 - 1.2 adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work
 - 1.3 report any loss or damage to equipment (where applicable)
 - 1.4 report any identified hazards within the work area (where applicable)
 - 1.5 return all consumables and materials to their correct location
 - 1.6 complete any documentation as required.

Learning outcome

The learner will:

- 2 carry out reinstatement activities on **two** work areas from:
 - 2.1 workshops/hangers
 - 2.2 airside
 - 2.3 areas at height (such as platforms, staging, lifts)
 - 2.4 internal areas of aircraft (such as wings, tanks, fuselage sections)
 - 2.5 office environment
 - 2.6 Computer Aided Design (CAD) environment

- 2.7 technical/clean room environment
 - 2.8 other specific environment.
-

Learning outcome

The learner will:

- 3 correctly label and store **four** the following resources:
 - 3.1 finished products/components
 - 3.2 scrap components
 - 3.3 components requiring overhaul/repair
 - 3.4 measuring and test instruments
 - 3.5 surplus materials/components
 - 3.6 finished drawings
 - 3.7 tooling, jigs, fixtures or other equipment used
 - 3.8 finished documentation
 - 3.9 drawings requiring actioning/adjusting
 - 3.10 documentation requiring actioning/adjusting.
-

Learning outcome

The learner will:

- 4 deal with waste materials, in line with company and environmental regulations, to include **two** of the following:
 - 4.1 correctly segregating waste materials
 - 4.2 correctly dispose of waste materials
 - 4.3 disposing of joining compounds, sealants and adhesives
 - 4.4 disposing of other chemical products
 - 4.5 removing non-hazardous materials
 - 4.6 disposing of fluid waste (such as oil, hydraulic fluids, fuel).

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

- K1 explain the specific safety practices and procedures that they need to observe when reinstating the work area (such as any specific legislation, regulations/codes of practice for the activities, equipment or materials) and the responsibility these requirements place on them.
- K2 describe the hazards associated with reinstating the work area and how to minimise them and reduce any risks.
- K3 explain the safe working practices and procedures to be followed when carrying out the various activities (such as lifting and handling techniques).
- K4 explain what Personal Protective Clothing and Equipment (PPE) needs to be worn and where this can be obtained.
- K5 explain the importance of applying the appropriate behaviours in the workplace and the implications for both the apprentice and the business if these are not adhered to.
- K6 explain why work areas need to be restored to a set standard and what these requirements are.
- K7 describe the types of work area that will need to be restored (such as office environments, Computer Aided Design (CAD) environment, technical/clean room environment, workshops, test areas, stages and platforms and aircraft areas such as wing, tank, fuselage, airside section areas).
- K8 explain the importance of tool and equipment control and why this is critical within the aerospace industry.
- K9 explain the meaning of 'Foreign Object Debris' (FOD) and why it is vital to ensure that this does not occur or is removed.
- K10 describe the stores procedures for tools and equipment, documentation and surplus or waste materials.
- K11 explain what materials will need to be stored and disposed of and why they need to be segregated, correctly identified and labelled.
- K12 explain how the various disposal bins can be identified (such as colour coded, labelled).
- K13 explain the procedures for disposing of hazardous materials (such as chemicals, adhesives, oil, hydraulic fluids, fuel).
- K14 explain what documentation to be used on completion of reinstatement.
- K15 describe the extent of their own responsibility and to whom they should report if they have problems that they cannot resolve.

Unit 304

Reinstating the work area on completion of activities

Supporting Information

Unit guidance

Assessment Requirements

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Although all of the content and assessment requirements must be met in full employers can tailor the training outcomes to ensure that the content of the programme is specific to their requirements in terms of products, processes, procedures, tools, equipment, materials, documentation and information systems.

This will allow each organisation to develop their own specific and tailored apprentice training programme whilst meeting their own requirements whilst at the same time ensuring that the overall generic content is to a high standard in terms of depth and breadth to enable progression and/or transferability to other employers.

Unit aim

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to work efficiently and effectively in the workplace, in accordance with approved procedures and practices. Prior to undertaking the engineering activity, they will be required to carry out all necessary preparations within the scope of their responsibility. This may include preparing the work area and ensuring that it is in a safe condition to carry out the intended activities, ensuring they have the appropriate job specifications and instructions and that any tools, equipment, materials and other resources required are available and in a safe and usable condition.

On completion of the engineering activity, they will be required to return their immediate work area to an acceptable condition before recommencing further work requirements. This may involve placing completed work in the correct location, returning and/or storing any tools and equipment in the correct area, identifying any waste and/or scrapped materials and arranging for their disposal, and reporting any defects or damage to tools and equipment used.

Their responsibilities will require them to comply with organisational policy and procedures for the engineering activities undertaken, and to report any problems with the activities, tools or equipment that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They will be expected to take personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide a good understanding of their work, and will provide an informed approach to working efficiently and effectively in an engineering environment. They will understand the need to work efficiently and effectively, and will know about the things they need to consider when preparing and tidying up the work area, how to contribute to improvements, deal with problems, maintain effective working relationships, and agree their development objectives and targets, in adequate depth to provide a sound basis for carrying out the activities safely and correctly.

They will understand the safety precautions required when carrying out engineering activities. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the occupational behaviours required in the workplace to meet the job profile and overall company objectives, including being able to demonstrate; personal responsibility and resilience, working effectively in teams, effective communication and interpersonal skills, focus on quality and problem solving and continuous development.

Learning outcome

P Performance Requirements

Assessment criteria

The learner can:

- P1 work safely at all times, complying with health and safety and environmental legislation, regulations and other relevant guidelines.
- P2 demonstrate the required occupational behaviours in line with the job role and company objectives/values.
- P3 plan the engineering activities before they start them.
- P4 prepare the work area for carrying out the engineering activity.
- P5 obtain all necessary consumables, tools and equipment and check that they are in a safe and usable condition.
- P6 deal promptly and effectively with any engineering problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve.
- P7 maintain effective working relationships with colleagues and supervisors.
- P8 review personal training and development, as appropriate to the job role.
- P9 clean, tidy up and restore the work area on completion of the engineering activity.

Learning outcome

The learner will:

- 1 ensure that they apply **all** the following checks and practices at all times:

The learner can:

- 1.1 adhere to procedures or systems in place for risk assessment, COSHH, Personal Protective Equipment (PPE) and other relevant safety regulations.
 - 1.2 wear the appropriate personal protective equipment for the work area and specific activity being carried out.
 - 1.3 use all tools and equipment safely and correctly, and only for their intended purpose.
 - 1.4 ensure that the work area is maintained and left in a safe and tidy condition.
-

Learning outcome

The learner will:

- 2 demonstrate and apply **all** the following occupational behaviours:
 - 2.1 Personal responsibility and resilience:
 - 2.1a comply with health and safety guidance and procedures
 - 2.1b be disciplined and have a responsible approach to risk
 - 2.1c work diligently regardless of how much they are being supervised
 - 2.1d stay motivated and committed when facing challenges.
 - 2.2 Working effectively in teams:
 - 2.2a make an effort to integrate with the team
 - 2.2b support other people
 - 2.2c consider implications of their own actions on other people and activities
 - 2.2d work effectively to get the task completed.
 - 2.3 Effective communication and interpersonal skills:
 - 2.3a is an open and honest communicator
 - 2.3b communicate clearly using appropriate methods
 - 2.3c listen well to others
 - 2.3d have a positive and respectful attitude.
 - 2.4 Focus on quality and problem solving:
 - 2.4a follow instructions and guidance
 - 2.4b demonstrates attention to detail
 - 2.4c follow a logical approach to problem solving.
 - 2.5 Continuous development:
 - 2.5a reflect on skills, knowledge and behaviours and seeks opportunities to develop

- 2.5b adapt to different situations, environments or technologies
- 2.5c has a positive attitude to feedback and advice.

Learning outcome

The learner will:

- 3 prepare to carry out the engineering activity, ensuring **all** the following as applicable to the activity to be undertaken:
 - 3.1 the work area is free from hazards and is suitably prepared for the activities to be undertaken
 - 3.2 any required safety procedures are implemented
 - 3.3 any necessary personal protection equipment is obtained, and is in a usable condition
 - 3.4 all necessary drawings, specifications and associated documents are obtained
 - 3.5 job instructions are obtained and understood
 - 3.6 tools and equipment required are obtained and checked that they are in a safe and useable condition
 - 3.7 the correct materials or components are obtained
 - 3.8 appropriate authorisation to carry out the work is obtained.
-

Learning outcome

The learner will:

- 4 complete the work activities to include **all** of the following:
 - 4.1 returning tools and equipment to the designated location
 - 4.2 returning drawings and work instructions
 - 4.3 disposing of waste materials, in line with organisational and environmental requirements
 - 4.4 completing all necessary documentation accurately and legibly
 - 4.5 identifying, where appropriate, any damaged or unusable tools or equipment.
-

Learning outcome

The learner will:

- 5 recognise and deal with problems affecting the engineering activity to include **two** of the following:
 - 5.1 materials
 - 5.2 job specification
 - 5.3 timescales
 - 5.4 tools and equipment
 - 5.5 quality
 - 5.6 safety
 - 5.7 drawings
 - 5.8 people
 - 5.9 work activities or procedures
 - 5.10 other.

Learning outcome

The learner will:

- 6 contribute to developing their own Continuous Development Plan (CPD) relevant to their career aspirations to include **all** the following:
 - 6.1 describing the levels of skill, knowledge and understanding needed for competence in the areas of work expected of them
 - 6.2 describing their development objectives/program, and how these were identified
 - 6.3 providing information on their expectations and progress towards their identified objectives
 - 6.4 using feedback and advice to improve their personal development and performance objectives.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

- K1 the safe working practices and procedures to be followed whilst preparing and tidying up your work area.
- K2 the importance of applying the appropriate occupational behaviours in the workplace and the implications for both the apprentice and the business if these are not adhered to.
- K3 how to present themselves in the workplace suitably dressed for the activities to be undertaken (such as being neat, clean and dressed in clothes appropriate to the area of activity).
- K4 the importance of reporting to work on time and returning from breaks on time and the potential consequences if this is not adhered to.
- K5 the types of attitudes and behaviours that are likely to create conflict or negative responses.
- K6 the benefits of team working and understanding of team objectives.
- K7 the roles of individual team members and the strengths they bring to the team.
- K8 the importance of clear communication both oral and written, using appropriate language and format.
- K9 the need to change communication styles to meet the needs of the target audience.
- K10 the need to adhere to timescales set for work, whilst maintaining appropriate quality standards and the implications if these are not adhered to.
- K11 the importance of seeking additional support and guidance when required.
- K12 why it is important to be open and honest and admit to any errors and/or mistakes.
- K13 the need to be flexible in their approach to work, responding positively to changes or amendments required by the business.
- K14 the importance of taking an active and positive part in the implementation of any amendments or changes to work requirements.

- K15 their individual responsibility to work in an ethical manner and the organisations policies relating to ethical working and behaviours.
- K16 the importance of respecting others, including an awareness of diversity and inclusion.
- K17 the personal protective equipment (PPE) to be worn for the engineering activities undertaken (such as correctly fitting overalls, safety shoes, eye protection, ear protection).
- K18 the correct use of any equipment used to protect the health and safety of themselves and their colleagues.
- K19 planning and preparing to carry out the engineering activity (such as obtaining the appropriate drawings/documentation to be used, determining the materials required, determining the tools and equipment required, determining a suitable sequence of operations, determining the quality checks to be made and equipment to be used).
- K20 the procedure for ensuring that all documentation relating to the work being carried out is available, prior to starting the activity.
- K21 the procedure for ensuring that all tools and equipment are available prior to undertaking the activity.
- K22 the checks to be carried out to ensure that tools and equipment are in full working order, prior to undertaking the activity.
- K23 the checks to be carried out to ensure that all materials required are correct and complete, prior to undertaking the activity.
- K24 how to deal effectively with problems that could arise with areas such as quality, safety, people, drawings and other documentation, tools and equipment or if material are incomplete or do not meet the requirements of the activity and the action that should be taken.
- K25 their role in helping to develop their own skills and knowledge (such as checking with their supervisor about the work they are expected to carry out and the standard required to achieve; the safety points to be aware of and the skills and knowledge you will need to develop).
- K26 the benefits of continuous personal development, and the training opportunities that are available in the workplace.
- K27 the importance of reviewing their training and development with trainers and supervisors, of comparing the skills, setting objectives to overcome any shortfall or address any development needs.
- K28 their responsibilities for providing evidence of your performance and progress (such as submitting work for assessment or the completion of assignments or tests).
- K29 the importance of maintaining effective working relationships within the workplace (such as listening attentively to instructions from their supervisor, making sure they ask for help and advice in a polite and courteous manner, responding positively to requests for help from others).
- K30 the reason for informing others of their activities which may have impact on their work (such as the need to temporarily disconnect a shared resource like electricity or compressed air supply; making undue noise or creating sparks, fumes or arc flashes from welding).
- K31 dealing with disagreements with others in ways which will help to resolve difficulties and maintain long term relationships.
- K32 the organisational procedures to deal with and report any problems that can affect working relationships.

- K33 the difficulties that can occur in working relationships, and how to resolve them.
- K34 the current legislation covering discrimination in the workplace on the ground of race, religion sex, age and disability.
- K35 the need to dispose of waste materials and consumables (such as oils and chemicals) in a safe and environmentally friendly way.
- K36 where tools and equipment should be stored and located, and the importance of returning all tools and documentation to their designated area on completion of your work activities.
- K37 when to act on their own initiative and when to seek help and advice from others
- K38 the importance of leaving the work area in a safe condition on completion of your activities (such as equipment correctly isolated, cleaning the work area and removing and disposing of waste).

Unit 455

Working efficiently and effectively in engineering

Supporting Information

Assessment Requirements

Assessment requirements have been developed by employers for the occupational competency units and qualifications for Advanced Manufacturing and Engineering Sector. These assessment requirements are set out in the relevant Qualification Assessment Strategy available from Semta. Please contact Customer.Services@semta.org.uk quoting Advanced Manufacturing and Engineering Qualification Assessment Strategy and specify the title of the relevant Trailblazer Standard

Although all of the content and assessment requirements must be met in full employers can tailor the training outcomes to ensure that the content of the programme is specific to their requirements in terms of products, processes, procedures, tools, equipment, materials, documentation and information systems.

This will allow each organisation to develop their own specific and tailored apprentice training programme whilst meeting their own requirements whilst at the same time ensuring that the overall generic content is to a high standard in terms of depth and breadth to enable progression and/or transferability to other employers.

Appendix 1 Relationships to other qualifications

Links to other qualifications

Centres are responsible for checking the different requirements of all qualifications they are delivering and ensuring that candidates meet requirements of all units/qualifications.

Literacy, language, numeracy and ICT skills development

This qualification can develop skills that can be used in the following qualifications:

- Functional Skills (England) – see www.cityandguilds.com/functionalskills
- Essential Skills (Northern Ireland) – see www.cityandguilds.com/essentialskillsni
- Essential Skills Wales – see www.cityandguilds.com/esw

Appendix 2 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the Centres and Training Providers homepage on www.cityandguilds.com.

Centre Manual - Supporting Customer Excellence contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification, as well as updates and good practice exemplars for City & Guilds assessment and policy issues.

Specifically, the document includes sections on:

- The centre and qualification approval process
- Assessment, internal quality assurance and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Management systems
- Maintaining records
- Assessment
- Internal quality assurance
- External quality assurance.

Our Quality Assurance Requirements encompasses all of the relevant requirements of key regulatory documents such as:

- SQA Awarding Body Criteria (2007)
- NVQ Code of Practice (2006)

and sets out the criteria that centres should adhere to pre and post centre and qualification approval.

Access to Assessment & Qualifications provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information on such things as:

- **Walled Garden:** how to register and certificate candidates on line
- **Events:** dates and information on the latest Centre events
- **Online assessment:** how to register for e-assessments.

Centre Guide – Delivering International Qualifications contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification.

Specifically, the document includes sections on:

- The centre and qualification approval process and forms

- Assessment, verification and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Frequently asked questions.

Appendix 3 Useful contacts

UK learners

General qualification information

E: learnersupport@cityandguilds.com

International learners

General qualification information

F: +44 (0)20 7294 2413

E: intcg@cityandguilds.com

Centres

Exam entries, Certificates,
Registrations/enrolment, Invoices,
Missing or late exam materials, Nominal
roll reports, Results

F: +44 (0)20 7294 2413

E: centresupport@cityandguilds.com

Single subject qualifications

Exam entries, Results, Certification,
Missing or late exam materials, Incorrect
exam papers, Forms request (BB, results
entry), Exam date and time change

F: +44 (0)20 7294 2413

F: +44 (0)20 7294 2404 (BB forms)

E: singlesubjects@cityandguilds.com

International awards

Results, Entries, Enrolments, Invoices,
Missing or late exam materials, Nominal
roll reports

F: +44 (0)20 7294 2413

E: intops@cityandguilds.com

Walled Garden

Re-issue of password or username,
Technical problems, Entries, Results, e-
assessment, Navigation, User/menu
option, Problems

F: +44 (0)20 7294 2413

E: walledgarden@cityandguilds.com

Employer

Employer solutions, Mapping,
Accreditation, Development Skills,
Consultancy

T: +44 (0)121 503 8993

E: business@cityandguilds.com

Publications

Logbooks, Centre documents, Forms,
Free literature

F: +44 (0)20 7294 2413

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City & Guilds Group

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