Qualification Manual

EAL Level 3 Advanced Diploma in Engineering Technology

(Version 1)

Qualification Code: 601/4564/X

Contents

1.0 About EAL

Since 1964, **EAL (Excellence Achievement and Learning)** has been awarding superior vocational qualifications and apprenticeship components for engineering, building services and related sectors.

Developed to the highest technical standard, our qualifications are regularly updated to reflect regulatory and technical changes. We support the providers of our qualifications with an unparalleled level of service to ensure that learners are well prepared for the roles they plan to take on.

EAL recognise the value of skills in the work environment as one of the 5 key drivers of productivity; essential for economic growth and bringing a number of wider social benefits. Through its programme of continuous improvement EAL strives to meet the demand from employers for high performing, high quality products.

1.1 Equal Opportunities and Diversity

EAL expects Centres to enable individuals to have equal access to training and assessment for qualifications irrespective of their sex, marital status, age, religion, colour, race, nationality, ethnic origin or disability. In essence Centres must deliver our qualifications and units in accordance with relevant equalities legislation.

Centres are required to have in place a policy to ensure that such discrimination does not occur either directly, indirectly or as a result of pressure from other bodies. This policy should apply to all satellites Centres and there should be arrangements in place to monitor its application and effectiveness.

Where complaints relating to issues of inequality cannot be satisfactorily resolved by the Centre, learners must be made aware of their right to appeal to EAL via the arrangements outlined in our Enquiries and Appeals Policy.

1.2 Complaints

Customer service is a fundamental part of EAL's commitment to industry. Our long-term partnership with industry and recognised Centres – which is underpinned by our unique External Verification Service and world class customer service – means our support is based on unrivalled understanding of our customers' needs.

EAL aims to ensure that all customers receive a high quality and efficient service and we continually monitor the levels of service provided. There may be times, however, when you may feel that we have not provided an adequate service.

In these situations, please contact our customer services team:

- EAL Customer Services:
- Tel: +44 (0)1923 652 400
- Email: customercare@eal.org.uk

2.0 Introduction to the Qualifications

2.1 Overview

The Level 3 Advanced Diploma in Engineering Technology is intended as a Technical Level qualification. It has been specifically designed for 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 provides learners with underpinning knowledge and related practical skills in a range of engineering subjects, along with practical experience and some expectation of the situations that they could face in an engineering job role. The content is grouped into seven specialist pathways, each one relating to a distinct occupational area – mechanical engineering maintenance, fabrication and welding, sheet metal plate and pipework fabrications, electrical engineering, electronics engineering, engineering design, and fluidics. Learners will complete five mandatory units within one of the pathways, including a core unit on environmental health and safety.

Some learners may have already completed a relevant level 2 qualification, such as the EAL Level 2 First Certificate or First Diploma in Engineering Technology, and will now be looking to further develop their skills and knowledge in engineering technology as part of a more specialised course of study at level 3.

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. The relationship between the units of the qualification and the relevant National Occupational Standards is set out in Appendix 1.

The qualification can be delivered in a school, college or other learning provider, using a combination of practical workshops and theory sessions. Assessment includes externally set and marked examinations, Centre marked practical and/or theory assessments, and a final cross-unit synoptic assessment.

Work experience is encouraged and employers should be involved in delivery and/or assessment of the qualification to help enrich the learning experience and provide a clear line of sight to work (see Section 5.8 for further information on employer involvement).

2.2 Entry requirements

There are no formal entry requirements for this qualification. However, learners must be at least 16 years of age and 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.

2.3 Qualification content

The qualification has seven pathways, each comprising two core units covering engineering principles and technology, and environmental health and safety, along with four other mandatory units relating to key skills and knowledge in one of the following occupational areas:

- Mechanical engineering maintenance
- Fabrication and welding
- Sheet metal, plate and pipework fabrications
- Electrical engineering
- Electronics engineering
- Engineering design (CAD/CAM)
- Fluidics

The units and associated assessments that relate to each of these pathways, as listed in Section 3.0 and in Section 6.0 of this manual, comprise 450 Guided Learning Hours (GLH).

2.4 Achievement of this Qualification

The EAL Level 3 Advanced Diploma in Engineering Technology will be awarded when the learner has successfully completed:

- The **two core mandatory units**, comprising the on-screen multiple-choice examinations
- **ALL** units from **ONE** of the specialist pathways, comprising Centre marked practical/theory assessments
- **The specified** synoptic assessment

The learner will also receive a Certificate of Unit Credit, listing all the units they have completed.

2.5 Progression opportunities

The EAL Level 3 Advanced Diploma in Engineering Technology will not automatically qualify individuals to work in specific job roles within the engineering sector. However, it does offer a stepping stone into employment by providing learners with the opportunity to progress on to one of the following apprenticeships and/or Industry recognised qualifications at level 3:

Apprenticeships

- Mechanical engineer
- Maintenance engineer
- Fabrication and welding engineer
- Sheet metalwork engineer
- Pipework engineer
- Electrical engineer
- Electronics engineer
- Design engineer

Industry Recognised Qualifications

- EAL Level 3 Diploma in Engineering Maintenance
- EAL Level 3 Extended Diploma in Engineering Maintenance
- EAL Level 3 Diploma in Installation and Commissioning
- EAL Level 3 Extended Diploma in Installation and Commissioning
- EAL Level 3 Diploma in Mechanical Manufacturing Engineering
- EAL Level 3 Extended Diploma in Mechanical Manufacturing Engineering
- EAL Level 3 Diploma in Fabrication and Welding Engineering
- EAL Level 3 Extended Diploma in Fabrication and Welding Engineering
- EAL Level 3 Diploma in Electrical and Electronic Engineering
- EAL Level 3 Extended Diploma in Electrical and Electronic Engineering
- EAL Level 3 Diploma in Engineering Technical Support
- EAL Level 3 Extended Diploma in Engineering Technical Support
- EAL Level 3 Diploma in Mechanical Manufacturing Engineering
- EAL Level 3 Extended Diploma in Engineering Toolmaking

Further information about apprenticeships and industry recognised qualifications in the engineering sector can be obtained from the EAL website, or by contacting:

EAL Customer Services
Tel: +44 (0)1923 652400
Email: customercare@eal.org.uk

2.6 Accreditation & Industry Support for this Qualification

The EAL Level 3 Advanced Diploma in Engineering Technology has been developed in consultation with colleges, training associations and industry to ensure that it meets the needs of the engineering sector.

The qualification is:

- Accredited by Ofqual at level 3 of the National Qualifications Framework (NQF)
- Endorsed by employers as facilitating progression to an apprenticeship and/or one or more of the industry recognised qualifications at level 3*

*Letters of endorsement from employers and other organisations can be viewed on the EAL website.

2.7 Qualification Support Materials

The following support materials are available for these qualifications:

- **Delivery Packs**, which contain the qualification units, all relevant tutor guidance relating to delivery and assessment, checklists, and marking schemes for practical/theory assessments

- **Learner Packs**, which contain the qualification units, the practical/theory assessments, and all associated guidance for learners

- **The externally set synoptic assessment**, which must be taken by learners during the last term, or the last third of their learning programme

- **Guidance for Developing Centre-devised Synoptic Assessments,** which provides guidance to Centres on devising their own synoptic assessments and obtaining approval for these from EAL

- **Sample questions** for the externally set and marked on-screen tests

- **One practice question paper for each externally set and marked on-screen test**, with feedback to learners on their performance

All materials can be accessed by EAL registered Centres from the EAL Website **www.eal.org.uk**

3.0 Qualification Structure

The Level 3 Advanced Diploma in Engineering Technology will be awarded to learners once they have completed the required assessments for the TWO core mandatory units, ALL units in ONE of the seven optional pathways, and the synoptic assessment (see Section 6.0 for further information about assessment).

Achievement of the qualification will require at least 450 Guided Learning Hours (GLH).

Mandatory core units – both units must be completed:

EAL code	Unit title	Level	GLH	Ofqual code
NETP/001	Engineering principles and technology	3	75	L/506/5002
NETA/001	Engineering and environmental health and safety	3	75	A/506/4962

Pathway NEA: Mechanical engineering maintenance

Mandatory units – all **four** units must be completed:

EAL code	Unit title	Level	GLH	Ofqual code
NETA/028	Maintenance engineering principles	3	75	K/506/4990
NETA/029	Maintenance of mechanical systems	3	75	M/506/4991
NETA/030	General engineering maintenance techniques	3	75	T/506/4992
NETA/039	Mechanical engineering principles	3	75	Y/506/4998

Pathway NEB: Fabrication and welding

Mandatory units – all **four** units must be completed:

EAL code	Unit title	Level	GLH	Ofqual code
NETA/016	Fabrication and welding principles	3	75	H/506/4972
NETA/018	Manual Metal-Arc (MMA) welding	3	75	T/506/4975
NETA/019	Metal Inert Gas/Metal Active Gas (MIG/MAG) welding	3	75	F/506/4977
NETA/020	Tungsten Inert Gas (TIG) welding	3	75	F/506/4980

Pathway NEC: Sheet metal, plate and pipework fabrications

Mandatory units – all **four** units must be completed:

EAL code	Unit title	Level	GLH	Ofqual code
NETA/016	Fabrication and welding principles	3	75	H/506/4972
NETA/023	Producing sheet metal fabrications	3	75	J/506/4981
NETA/024	Producing plate fabrications	3	75	L/506/4982
NETA/025	Producing pipework fabrications	3	75	L/506/5310

Pathway NED: Electrical engineering

Mandatory units – all **four** units must be completed:

EAL code	Unit title	Level	GLH	Ofqual code
NETA/009	Electrical and electronic principles	3	75	K/506/5010
NETA/011	Measurement methods and control engineering	3	75	L/506/4965
NETA/015	Electrical testing and commissioning	3	75	Y/506/4970
NETA/038	Installation of electrical equipment	3	75	R/506/4997

Pathway NEE: Electronics engineering

Mandatory units – all **four** units must be completed:

EAL code	Unit title	Level	GLH	Ofqual code
NETA/009	Electrical and electronic principles	3	75	K/506/5010
NETA/012	Analogue electronics	3	75	Y/506/4967
NETA/013	Digital electronics	3	75	D/506/4968
NETA/014	Microelectronics	3	75	H/506/4969

Pathway NEF: Engineering design (CAD/CAM)

Mandatory units – all **four** units must be completed:

EAL code	Unit title	Level	GLH	Ofqual code
NETA/006	Computer aided design (CAD) techniques	3	75	F/506/4963
NETA/007	Computer numerical control (CNC) programming/machining	3	75	J/506/4964
NETA/039	Mechanical engineering principles	3	75	Y/506/4998
NETA/043	Engineering design process	3	75	D/506/4999

Pathway NEG: Fluidics

Mandatory units – all **four** units must be completed:

EAL code	Unit title	Level	GLH	Ofqual code
NETA/033	Maintenance of fluid power systems and components	3	75	A/506/4993
NETA/034	Maintenance of hydraulic systems and components	3	75	F/506/4994
NETA/035	Maintenance of pneumatic systems and components	3	75	J/506/4995
NETA/039	Mechanical engineering principles	3	75	Y/506/4998

Content of the units
Each unit that forms part of the qualification relates to a defined area of skills and/or knowledge and contains the following information:

- **A unit title** – this provides a concise description of unit content
- **Guided learning hours (GLH)** – this is the number of hours of teacher-supervised or directed study time that is normally required to teach the content of the unit
- **Unit aim** – this sets out the broad purpose and objective of the unit
- **Unit assessment information** – this sets out the assessment methods for the unit and/or other specific requirements that need to be adhered to in assessing the unit
- **Learning outcomes** – these specify what a learner is expected to know, understand or be able to do as a result of the process of learning
- **Assessment criteria** – these specify the standard a learner is expected to meet to demonstrate that the learning outcomes of the unit have been achieve, and will be used as the basis for any assessments that the learner undertakes

4.0 Centre & Qualification Approval

Centres wishing to run the qualification will need to comply with the Qualification Manual and EAL's Centre recognition criteria for this qualification upon accreditation and launch.

Centres must also put in place the appropriate physical and human resources and administration systems to effectively run the qualification. Please refer to Section 5.0 for the requirements of Centre staff involved in the delivery of the qualification.

For *existing* EAL Centres to add this qualification to their Centre remit:

Create and complete a Qualification Approval Application form in Smarter Touch and submit to EAL.

For *non* EAL Centres to gain Centre approval to run the qualification:

Please contact the EAL Customer Services Department who will be delighted to hear from you:

EAL Customer Services
Tel: +44 (0)1923 652400
Email: customercare@eal.org.uk

5.0 Profiles & Requirements

The staff involved in the delivery of this qualification at the Centre must meet ALL of the requirements in this section of the Manual.

5.1 Staff responsible for registering and certificating learners

Centres are required to appoint a suitable member of staff who can take responsibility for registering learners onto the qualification, submitting entries for externally set assessments to EAL, and taking receipt of external assessment procedures. They may also be responsible for applying to EAL for learner certificates. The role may be undertaken by the same person who undertakes quality assurance (see Section 5.4).

5.2 Teaching staff

Teaching staff must have knowledge and understanding of:

- The occupations covered by this qualification.
- The qualification structure and content.
- The learning outcomes and assessment criteria they are delivering.

It is a recommendation that teaching staff will:

- Have 2 years' experience in teaching/training
  or
- Be working towards an appropriate teaching/training qualification (e.g. Cert Ed or Learning & Development trainer units)
  or
- Hold an appropriate teaching/training qualification (e.g. Cert Ed or Learning & Development trainer units)

Note: all teaching staff within a state-maintained school in England or Wales will need to have Qualified Teacher Status (QTS), or hold the full professional status of Qualified Teacher Learning and Skills (QTLS) with the Institute for Learning (IfL). See the following link for further information:

https://www.gov.uk/qualified-teacher-status-qts

5.3 Internal assessors

The Centre MUST provide EAL with the names of any teachers, trainers or other individuals who will undertake internal assessment, so that these can be approved prior to them carrying out an assessment role. Internal assessment includes internally assessed assignments and practical tests that are provided for each unit, as well as the final synoptic assessment.

Internal Assessors must:

- Have knowledge and understanding of the assessment criteria they are assessing
- Have knowledge and understanding of the qualification structure, content and assessment components
- Understand the assessment process

Internal Assessors must also:

- Have 2 years' experience in assessment (e.g. within an N/SVQ or teaching/training environment)
  Or
- Be working towards an appropriate assessment qualification, such as the 'Level 3 Award in Assessing Vocationally Related Achievement'
  Or
- Hold an appropriate assessment qualification (as above)

Internal Assessors that hold either 'D' or 'A' units must also have evidence of Continuing Professional Development (CPD) to demonstrate compliance with the current assessor standards.

Note: 'Candidate Assessors' who are working towards their Assessor qualifications and who do not have the requisite 2 years' experience must be supervised by a Qualified Assessor. Candidate Assessors must have a clear action plan for achieving the Assessor qualification(s). Assessor approval will be withdrawn if a relevant qualification has not been attained within 18 months.

Industry experience
Assessors must have verifiable evidence of industry experience and current knowledge of the industry, including its settings, working practices and techniques, legislative and regulatory requirements, Codes of Practice and guidance that are relevant to the occupational area. The verifiable evidence must be at or above the level being assessed.

Assessor Continuing Professional Development
The occupational competence of assessors must be updated on a regular basis and be periodically confirmed via continuing professional development (CPD) via the Assessment Centre. Evidence of CPD will be sought by the External Verifier for all approved Assessors at the Centre.

It is the responsibility of each assessor to identify and make use of opportunities for CPD, such as industry conferences, access to trade journals, and Professional Body/Trade Association events, at least on an annual basis to enhance and upgrade their professional development and technical knowledge. It is imperative that records are kept of all such CPD opportunities/occasions and that they provide evidence of cascading such technical knowledge and industry intelligence to all relevant colleagues.

5.4 Quality assurance staff

The Centre MUST provide EAL with the names of any teachers, trainers or other individuals who will undertake internal quality assurance, so that these can be approved prior to them carrying out this role.

The main focus of internal quality assurance for this qualification is:

- The quality assurance of assessment procedures, including standardisation of assessment practice across different assessors within the Centre
- Internal standardisation of marking and moderation of learner marks awarded for the final synoptic assessment

Internal quality assurance staff must:

- Be familiar with the occupation(s) covered by this qualification
- Have knowledge and understanding of the qualification structure and content
- Understand the assessment process and the role of quality assurance

Internal quality assurance staff must also:

- Have experience in quality management/internal verification
  Or
- Hold an appropriate qualification, such as the 'Level 4 Award in the Internal Quality Assurance of Assessment Processes and Practice, or the 'Level 4 Certificate in Leading the Internal Quality Assurance of Assessment Processes and Practice'

Quality assurance staff are also required to have a minimum of occupational experience evidenced by having an engineering sector related qualification or proven sector competence and/or experience, plus access to relevant 'occupational expertise', which will enable them to conduct their quality assurance role appropriately. This evidence and access to 'occupational expertise' is quality assured by EAL.

Internal quality assurance staff that carry out moderation of synoptic assessment
Internal quality assurance staff that carry out moderation of learner marks for the synoptic assessment must, in addition to the above requirements:

- Have knowledge and understanding of the assessment criteria being assessed
- Have verifiable evidence of industry experience and current knowledge of the industry, including its settings, working practices and techniques, legislative and regulatory requirements, Codes of Practice and guidance, which must be at or above the level being assessed and relevant to the occupational area.

The Centre must confirm with EAL the names of any individuals who will carry out internal moderation of the synoptic assessment, so that specific approval can be given.

Continuing professional development of internal quality assurance staff
The occupational experience of quality assurance staff must be updated on a regular basis and be periodically confirmed via continuing professional development (CPD) via the Assessment Centre. This will be quality assured by EAL.

It is the responsibility of each internal quality assurance staff member to identify and make use of opportunities for CPD, such as industry conferences, access to trade journals, and Professional Body/Trade Association events, at least on an annual basis to enhance and upgrade their professional development and technical knowledge. It is imperative that records are kept of all such CPD opportunities/occasions and that they provide evidence of cascading such technical knowledge and industry intelligence to all relevant colleagues.

5.5 Staff invigilating assessments under controlled conditions

Members of staff with responsibility for invigilating on-screen tests must know, understand and comply with the Procedures for Conducting the Exam Component within EAL Qualifications' (EAF 1), which are published by EAL. These members of staff must also:

- Have experience in conducting and controlling exam sessions; **Or**
- Be supervised by an individual experienced in conducting and controlling exam sessions

Note: A teacher/tutor who has prepared the learners for the subject of the exam must not be the *sole* supervisor at any time during an exam for that subject(s).

5.6 Physical Resources

Safe working is a key issue and all practical activities conducted within the Centre must be subject to up-to-date risk assessments. All learners must be properly supervised and wear the correct personal protective equipment, where appropriate. Arrangements for first aid and emergency action in case of accident must be in place.

For practical assessments, the required resources or guidance will be detailed within the associated documentation provided by EAL.

5.7 Learners with particular requirements

Centres should make learners with particular requirements aware of the practical and theoretical content of the qualification and they should be given every opportunity to complete the qualification. EAL will consider any reasonable requests for and from, those with disabilities that would help them to achieve the learning outcomes without compromising the standards required. Aids or appliances, which are designed to alleviate disability, may be used during assessment, providing they do not compromise the standard required. Any requests will be considered in line with EAL's Reasonable Adjustments Policy.

5.8 Involvement of employers in delivery and/or assessment

To provide a clear line of sight to work, enrich the learning experience, raise the credibility of the qualification in the eyes of employers, parents and learners, and enhance collaboration between the learning and skills sector and industry Centres must secure the involvement of employers and/or industry practitioners in the delivery and/or assessment of the qualification for each learner.

Participating employers and industry practitioners must be representative of the sector, occupation or occupational group to which the qualification relates.

Employers and industry practitioner involvement must be significant and meaningful and could relate to one or more of the following activities:

- Learners undertake structured work-experience or work placements that develop skills and knowledge relevant to the qualifications
- Learner undertake projects, exercises and/or assessments/examinations set with input from experienced industry practitioners
- Learners take one or more units delivered or co-delivered by industry practitioners – this could, for example, take the form of master classes or guest lectures
- Industry practitioners operating as 'expert witnesses' that contribute to the assessment of a learner's work or practice, operating within a specified assessment framework – this may be specific projects, exercises or exams, or all assessment for the qualification.

Centres should explore innovative ways of involving employers and industry practitioners in the delivery and/or assessment of the qualification and should set out their proposals in their approval application to EAL. The implementation of these proposals will be monitored by EAL as part of the External Quality Assurance (EQA) visits. Failure to secure employer involvement in the delivery and/or assessment of the qualification will be reviewed in accordance with EAL's sanctions policy.

6.0 Assessment

The following table indicates the assessment components that are included in the qualification and for each component:

- Who is responsible for setting and marking the component
- How the component is quality assured.

Assessment component	Set by	Marked by	Method of quality assurance	
			Internal	External
On-screen examinations[1]	EAL	EAL	Examination invigilation	Moderation of test results and spot checks
Centre marked practical/ theory assessments[2]	EAL	Centre	On-going standardisation within the Centre	Verification and continuous monitoring via EQA visits
Final synoptic assessment[3]	EAL	Centre	Standardisation, including moderation of learner marks	Verification of final marks

1. Refer to Section 6.1 External Examinations.
2. Refer to Section 6.2 Internal (EAL Set and Centre Marked) Assessments.
3. Refer to Section 6.3 Synoptic (Centre Devised and Marked) Assessments.

The learner must pass **ALL** assessments to achieve the Qualification.

In accordance with DfE requirements relating to Vocational Qualifications for 16-19 year olds, learners that are unsuccessful in passing **external** assessments (set by EAL, marked by EAL) on the first attempt will be permitted **ONE** re-take using new assessment tasks provided by EAL. See Sections 6.1 for further information about re-taking each **external** assessment component.

A breakdown showing the assessment requirements for each unit is shown in the table below:

EAL Code	Unit title	On-screen exam	Centre marked practical/theory assessment
NETP/001	Engineering principles and technology	YES	NO
NETA/001	Engineering and environmental health and safety	YES	NO
NETA/006	Computer aided design (CAD techniques	NO	YES
NETA/007	Computer numerical control (CNC) programming/machining	NO	YES
NETA/009	Electrical and electronic principles	NO	YES
NETA/011	Measurement methods and control engineering	NO	YES
NETA/012	Analogue electronics	NO	YES
NETA/013	Digital electronics	NO	YES
NETA/014	Microelectronics	NO	YES
NETA/015	Electrical testing and commissioning	NO	YES
NETA/016	Fabrication and welding principles	NO	YES
NETA/018	Manual Metal-Arc (MMA) welding	NO	YES
NETA/019	Metal Inert Gas/Metal Active Gas (MIG/MAG welding	NO	YES
NETA/020	Tungsten Inert Gas (TIG) welding	NO	YES
NETA/023	Producing sheet metal fabrications	NO	YES
NETA/024	Producing plate fabrications	NO	YES
NETA/025	Producing pipework fabrications	NO	YES
NETA/028	Maintenance engineering principles	NO	YES
NETA/029	Maintenance of mechanical systems	NO	YES
NETA/030	General engineering maintenance techniques	NO	YES
NETA/033	Maintenance of fluid power systems and components	NO	YES
NETA/034	Maintenance of hydraulic systems and components	NO	YES
NETA/035	Maintenance of pneumatic systems and components	NO	YES
NETA/038	Installation of electrical equipment	NO	YES
NETA/039	Mechanical engineering principles	NO	YES
NETA/043	Engineering design process	NO	YES

6.1 External assessment

External assessment comprises two externally set and marked on-screen multiple-choice examinations, which have been designed to assess knowledge and understanding in each of the two core mandatory units. This amounts to 33% of the total qualification content.

A specification for each examination, indicating the number of questions to be set for each learning outcome is provided in Appendix 2.

Key Points

- External examinations are available on demand
- Each examination must be undertaken by the learner under controlled examination conditions, in accordance with EAL's Procedures for Conducting the Exam Component within EAL Qualifications' (EAF 1)
- Result are normally released within 24 hours, subject to external moderation
- The EAL co-ordinator within the Centre will assume responsibility for liaison and correspondence regarding the external assessment component
- Centres will be sampled and spot checks will be carried out by EAL to ensure examinations are delivered in accordance with EAL published procedures.
- The mark from each on-screen examination will be combined with the synoptic assessment mark to determine the overall grade for the qualification (see Section 8.0)
- Sample examination questions are available from EAL (see Section 2.7)

Re-taking externally set and marked examinations
Learners who fail to achieve a Pass in any externally set and marked examination will be permitted **ONE** re-take only.

Practice papers
One practice paper for each external examination is available to learners, which can be accessed via the EAL website (see Section 2.7). Practice papers are not part of the formal assessment arrangements and marks from these papers will therefore NOT count towards the qualification.

6.2 Internal (EAL Set and Centre Marked) Assessment

Internal assessment includes practical and/or theory assessments, which have been designed to assess the knowledge, understanding and skills of learners for individual units. The internal assessment for each unit is set by EAL and marked by members of the delivery team at the Centre. All assessment decisions are then subject to internal standardisation and external quality assurance.

Internal assessments involve collecting and evaluating evidence that demonstrates achievement of the learning outcomes in each unit. The internal assessments are accompanied by marking criteria, checklists and other materials to ensure that the delivery team is consistent in their approach to internal assessments across learners. The internal assessments and the accompanying marking/assessment criteria can be found in the individual units within the Delivery Pack.

Centres are responsible for ensuring that internal assessment is suitably controlled to ensure that assessment decisions are valid and reliable, and that work submitted for assessment by learners is prepared and produced by them independently, without assistance from others, and free of plagiarism.

Where the assessment takes the form of written/short answer or multiple choice question papers, these should be treated as controlled assessments therefore imposing the necessary restrictions on the learner, as necessary. Guidance sheets have also been created to hand out to the learners, to ensure they are aware how to complete the multiple choice and short answer questions papers.

All learning outcomes of the qualification must be assessed. In order to help meet this requirement it is advised that learners should produce a logbook/portfolio where they can file and make reference to evidence that shows their achievements against the learning outcomes. Centres should also maintain an assessment and feedback record for each learner, which details the evidence evaluated against the learning outcome and the feedback given to the learner. These records must be available to the External Verifier.

Further guidance on assessment is provided within each unit Delivery Pack.

Re-taking internal assessments
If any learners fail to reach the required standard in the internal assessment for a given unit they will be permitted to re-take this assessment after feedback and appropriate tuition has taken place.

Standardisation of internal assessment
Members of the internal quality assurance team at the Centre have an important role to play in ensuring that internal assessment is standardised. In particular, they should work with tutor/assessors to ensure that the correct procedures are being followed at all times, and to ensure that assessment decisions taken by different assessors are consistent, fair and reliable. Key activities will include:

- Meeting with tutor/assessors (individually and collectively) throughout the course to discuss quality assurance and standardisation issues and provide support and guidance where needed
- Observing tutor/assessors and giving them feedback to help improve their assessment technique
- Sampling learner evidence across different learner cohorts to ensure that appropriate standards have been met
- Arranging cross-marking of learner work to compare results and agree benchmarks

External quality assurance
The External Verifier (EV) appointed by EAL will visit the Centre periodically to monitor and sample Centre activity in line with the agreed monitoring strategy (see Section 7.0 for further details).

Submitting marks for the internal assessment
Subject to internal standardisation and external quality assurance being completed satisfactorily, and in accordance with EAL published procedures, the Centre should submit to EAL the confirmed grade (Pass or Refer) relating to the internal assessment of each unit, for each learner.

6.3 Synoptic Assessment

Learners must complete a final synoptic assessment at the end of their learning programme. The purpose of the synoptic assessment is for learners to demonstrate understanding, integration and application of learning across the whole vocational area.

The synoptic assessment is set by EAL, marked and moderated by the Centre and subject to external verification.

About the synoptic assessment

- Learners are required to complete a synoptic assessment for this qualification at the end of their learning programme – this might be during the final term of the programme, or within the last third of the specified number of guided learning hours required to complete the qualification
- The synoptic assessment will be set by EAL and comprise a work-related scenario and a series of connected tasks that must be completed
- The synoptic assessment will be designed to cover a range of assessment criteria from a number of units that are relevant to the scenario and related tasks
- The synoptic assessment will, together with the assessments relating to individual units, ensure that all learning outcomes within the qualification have been fully and appropriately covered
- The instructions provided with the synoptic assessment will specify the time allowed to complete the tasks, the type of evidence that is expected, and other requirements as appropriate
- A detailed marking scheme will be provided by EAL, which must be held securely in accordance with EAL procedures, and adhered to by all assessors who are involved in marking the synoptic assessment
- Delivery of the synoptic assessment will be subject to rigorous internal standardisation (including moderation of learner marks), prior to final marks being agreed by the EV
- The final marks for the synoptic assessment will be combined with the marks from the on-screen examinations and used to determine the overall grade for the qualification, in line with the grading requirements set out in Section 8.0 of this manual.

Note: Centres may devise their own synoptic assessments if they wish. In these circumstances, Centres must develop and submit their synoptic assessments to EAL for approval in line with EAL's guidance on 'Developing Centre Set Synoptic Assessments'. An approval fee will be charged by EAL.

Planning and conducting the Synoptic Assessment

- **Scheduling the synoptic assessment:** Arrangements must be made for learners to complete the synoptic assessment during the final term of their learning programme, or within the last third of the specified number of guided learning hours required to complete the qualification. Centres may determine the precise timing of the synoptic assessment to suit local needs.

- **Time allowed:** The time (number of hours) in which the synoptic assessment must be completed will be specified in the instructions that accompany it from EAL. The 'actual' number of hours spent on the synoptic assessment and the period over which it is completed must be logged by the learner and verified by Centre staff.

- **Setting a deadline for completing the synoptic assessment:** The Centre must specify a due date when learners must complete the synoptic assessment and submit their evidence for marking. The due date must fall within the designated period (see above) and be communicated clearly to learners. In setting the due date, consideration should be given to ensuring that:

    - Learners have a realistic period of time in which to complete the synoptic assessment, taking into consideration the specified number of hours and any possible limitations on access to equipment, materials etc

    - Sufficient time will be available for marking, moderation and external verification after the due date has passed.

    The due date should be communicated to the EV as soon as this has been agreed so that timing of external quality assurance, including the final EQA visit, can be co-ordinated with the Centre's timetable for marking and internal standardisation.

- **Resources:** Access to resources should be limited to those that are appropriate to the tasks to be completed as part of the synoptic assessment, taking account of any requirement for learners to select appropriate tools and materials, if this is specified in the assessment criteria.

- **Supervision:** The majority of the assessment must be under direct teacher/tutor supervision. It is acceptable for some aspects to be outside direct supervision however, the teacher MUST be able to authenticate the work.
- **Learner collaboration:** Learners must complete and evidence their work individually. Collaboration between learners undertaking any aspect of the synoptic assessment should only be allowed where tasks explicitly state that this is acceptable.

- **Completion and submission:** Any material evidence and other supporting information submitted by learners for the synoptic assessment should:

    - Have a front page showing the qualification name and level, synoptic assessment title, the name of learner and candidate number.
    - Have a page with task headings.
    - Have a contents page.
    - Have numbered pages.
    - Use a footer stating name, learner number and the assignment number.
    - Have a bibliography or references shown.

- **Late submission:** Learners must complete their synoptic assessment and hand in all relevant materials to the Centre by the due date. Any request to extend the submission date must be considered in accordance with EAL's policy for Special Consideration.

- **Feedback:** Feedback should NOT be given to learners on their performance in the synoptic assessment until after the results have been moderated, and confirmed by EAL.

Marking the synoptic assessment
Internal assessors should mark the synoptic assessment for each learner using the marking scheme provided. No other sources of information should be used to make judgements about the quality and sufficiency of the evidence.

Marking should be undertaken within 4 weeks of the specified deadline submission date.

Where the marks for individual learners indicate either a borderline pass or a borderline fail (i.e. 5 marks either side of the specified pass mark), these should be highlighted for review as part of the internal moderation process (see below).

All materials should be retained securely and confidentially by the Centre, in accordance with EAL policy.

Internal standardisation of synoptic assessment
Members of the internal quality assurance team at the Centre should work with tutors/assessors to ensure that the correct procedures relating to the delivery of the synoptic assessment are followed, and ensure assessment decisions taken by different assessors are consistent, fair and reliable.

In addition, once all learners have undertaken and completed the synoptic assessment and marking has been carried out, internal moderation should be undertaken by a nominated member of the quality assurance team. This will involve checking and/or re-marking a sample of learner's work in order to:

- Ensure that assessors have been consistent in their use of the marking scheme
- Ensure that marks have been allocated fairly and consistently for all learners
- Check the authenticity of learner evidence
- If appropriate, agree changes to marks where anomalies have been detected.

Internal moderation should be based on a sample of at least 25% of learners who have completed the synoptic assessment, and cover all assessors who have been involved in marking. The sample should include any borderline cases that have been identified for review by assessors. If there are fewer than 5 learners who have completed the synoptic assessment then all learners' work should be moderated.

Where inconsistencies or other discrepancies are identified, or where there is a disagreement on the marks allocated for particular learners, the level of sampling should be increased.

The outcomes from internal moderation of synoptic assessment, including any proposed changes to allocated marks, should be recorded and made available to the External Verifier.

External quality assurance of synoptic assessment
The EV will visit the Centre at the end of the learning programme to carry out external quality assurance of synoptic assessment, and to verify and agree final marks for this component (see Section 7.0).

All marks relating to the synoptic assessment should be treated as provisional until external quality assurance has been carried out. Under no circumstances should Centre staff offer feedback to learners on their performance in the synoptic assessment until external quality assurance has been completed and final marks have been confirmed.

Submitting marks for the synoptic assessment
Subject to internal standardisation and external quality assurance being completed satisfactorily, and in accordance with EAL published procedures, the Centre should submit to EAL the confirmed raw mark for the synoptic assessment, for each learner.

Re-taking the synoptic assessment
If, following internal standardisation and/or external verification any learners fail to reach the standard required to pass the synoptic assessment they will be permitted to re-take the assessment after feedback and appropriate tuition has taken place.

7.0 External Quality Assurance

There are three major activities in which EAL interacts with the Centre in relation to the External Quality Assurance for this qualification and these are:

- **Recognition:** When a Centre decides to offer the qualification, the EAL External Verifier (EV) ensures that the Centre is suitably equipped and prepared for delivery and assessment.
- **Engagement:** Throughout the ongoing delivery of the qualification EAL, through EV engagement and other mechanisms will review the quality and consistency of assessment and internal quality assurance and recommend actions to address issues of concern
- **Verification of synoptic assessment marks:** The EV will look specifically at the provisional marks awarded to learners for the synoptic assessment, in order to agree and confirm the final marks for this component.

Recognition

In granting recognition, EAL, normally through its EVs, will ensure that the prospective Centre:

- Meets any procedural requirements specified by EAL.
- Has sufficient and appropriate physical and staff resources.
- Meets relevant health and safety and/or equality and access requirements.
- Has a robust plan for the delivery, assessment and QA for the qualifications (including, where appropriate, scope for involving employers).

EAL may decide to visit the Centre to view the evidence provided.

Engagement

EAL, through EV engagement and other mechanisms will ensure that:

- A strategy is developed and deployed for the on-going engagement of the centre – this will be based on an active risk assessment of the Centre, and will include details of the learner, assessor and internal quality assurer's sampling strategy and the rationale behind this
- The Centre's internal quality assurance processes are effective in learner assessment
- Outcomes of internal assessment are verified, through sampling, to ensure standards are being maintained
- Sanctions are applied to a Centre where necessary and that corrective actions are taken by the Centre and monitored by the EV
- Reviews of EAL's external auditing arrangements are undertaken.

Verification of synoptic assessment marks

The EV will visit the Centre at the end of the learning programme to carry out external quality assurance of synoptic assessment, and to verify and agree final marks for this component.

During the visit the EV will ensure that marking and internal standardisation (including moderation) of the synoptic assessment has been carried out in accordance with EAL requirements. The EV will expect to review a sample of learners' marked synoptic assessments to ensure marks have been allocated fairly and consistently. The EV will pre-select the sample based on the information provided by the Centre and according to EAL set procedures.

The EV will take account of any specific issues that have been highlighted during the internal standardisation process, including any remaining concerns about borderline cases. The EV may increase the sample if any issues cannot be resolved, or if new issues arise that that need further investigation.

At the end of the visit, the EV will agree and confirm the final marks with the Centre so that these can be combined with the marks for the externally set and marked on-screen tests, and used as a basis for overall grading of the qualification.

8.0 Grading

Internal assessments are graded only as 'Pass' or 'Referred'. However, learners have the opportunity to achieve a Pass, Merit or Distinction for the overall qualification.

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

Providing learners are successful in all assessment components, the final grade for the qualification will be determined from the marks achieved by learners in the external examinations and the synoptic assessment. The overall grade for the qualification is determined as follows:

- The marks from the examinations are added together and divided by the total number to get the mean score. This is then expressed as a percentage. If there is only one examination then this mark is used (expressed as a percentage)
- The mark from the synoptic assessment is then expressed as a percentage
- The sum of the two percentages above are divided by 2 to give an overall final percentage score
- The final percentage score is then rounded up to the nearest whole number (if appropriate) and converted into an overall grade for the qualification using the following formula:

Grade	**Mean % score from exams and synoptic assessment**
Distinction	≥ 80%
Merit	65-79%
Pass	50-64%

Two examples of grading calculations for the Level 3 Advanced Diploma in Engineering Technology are outlined below:

Example 1: MERIT GRADE			
Component	**Learner mark (expressed as a percentage)**	**Mean score of exams and mark of synoptic assessment**	**Contribution to overall grade**
Exam (Unit NETP/001)	62	Mean score of exams (126/2) 63	50%
Exam (Unit NETA/001)	64		
Synoptic assessment	68	68	50%
	Total	131	
	Mean score (i.e. 131/2)	66	
	Qualification grade	MERIT	

Example 2: DISTICTION GRADE			
Component	**Learner mark (expressed as a percentage)**	**Mean score of exams and mark of synoptic assessment**	**Contribution to overall grade**
Exam (Unit NETP/001)	84	Mean score of exams (173/2) 86.5	50%
Exam (Unit NETA/001)	89		
Synoptic assessment	75	75	50%
	Total	161.5	
	Mean score (i.e. 162/2)	81	
	Qualification grade	DISTICTION	

Appendix 1: Links to National Occupational Standards

EAL Code	Unit title	Links to national occupational standards or other professional standards
NETP/001	Engineering principles and technology	O45NMME2.01
NETA/001	Engineering and environmental health and safety	O45NMME2.01
NETA/006	Computer aided design (CAD techniques	O45NETS3-05
NETA/007	CNC programming/machining	O45NMME3.30, O45NMME3.31
NETA/009	Electrical and electronic principles	O45NEEE06
NETA/011	Measurement methods and control engineering	O45NETS3-18
NETA/012	Analogue electronics	O45NEEE05
NETA/013	Digital electronics	O45NEEE05
NETA/014	Microelectronics	O45NETS3-33
NETA/015	Electrical testing and commissioning	O45NEEE34
NETA/016	Fabrication and welding principles	O45NFEW3-60, O45NFEW3.26
NETA/018	Manual Metal-Arc (MMA) welding	O45NFEW3.4
NETA/019	Metal Inert Gas/Metal Active Gas (MIG/MAG welding	O45NFEW3.5
NETA/020	Tungsten Inert Gas (TIG) welding	O45NFEW3.6
NETA/023	Producing sheet metal fabrications	O45NFEW3.25
NETA/024	Producing plate fabrications	O45NFEW3.38
NETA/025	Producing pipework fabrications	O45NFEW3.45
NETA/028	Maintenance engineering principles	O45NEM6
NETA/029	Maintenance of mechanical systems	O45NEM6
NETA/030	General engineering maintenance techniques	O45NEM6
NETA/033	Maintenance of fluid power systems and components	O45NEM20
NETA/034	Maintenance of hydraulic systems and components	O45NEM20
NETA/035	Maintenance of pneumatic systems and components	O45NEM20
NETA/038	Installation of electrical equipment	O45NIC06
NETA/039	Mechanical engineering principles	O45NETS3-56
NETA/043	Engineering design process	O45NENGM5-05

Appendix 2: Examination Specifications

Unit: Engineering principles and technology (NETP/001)		
Paper type: Multiple Choice Number of questions: 40 Time allowed: 1 hour and 20 minutes The examination will cover the knowledge learning outcomes of the units as follows:		
LO No.	**Knowledge learning outcome**	**No. of questions**
1	Understand measurement and marking out techniques applied to engineering	5
2	Understand engineering materials and material properties	8
3	Understand fundamental numeracy applied to engineering	11
4	Understand fundamental science applied to engineering	11
5	Understand forms of communication used within engineering	5

Unit: Engineering and environmental health and safety (NETA/001)		
Paper type: Multiple Choice Number of questions: 20 Time allowed: 40 minutes The examination will cover the knowledge learning outcomes of the units as follows:		
LO No.	**Knowledge learning outcome**	**No. of questions**
1	Understand health and safety roles and responsibilities	5
2	Understand the application of health and safety in the engineering environment	5
3	Understand the safe moving and storing of materials	5
4	Understand environmental management	5

NOTE: The pass mark for each examination is normally expected to be around 50%.

Appendix 3: Learner Registration & Certification

Learners must be registered with EAL on a code which relates to the qualification - this **must be** completed prior to assessment. Both learner registration and certification can be completed on line at the EAL Website www.eal.org.uk. For paper based registration and certification use forms CRF1, and CRF1A. These are located on the EAL Website, for guidance on registration and Certification please refer to the Registration and Certification User Guide.

To Register the Learner on the Chosen Qualification:

Qualification Title	Code
EAL Level 3 Advanced Diploma in Engineering Technology	
Pathway NEA: Mechanical engineering maintenance	601/4564/XNEA
Pathway NEB: Fabrication and Welding	601/4564/XNEB
Pathway NEC: Sheet metal, plate and pipework fabrications	601/4564/XNEC
Pathway NED: Electrical engineering	601/4564/XNED
Pathway NEE: Electronics engineering	601/4564/XNEE
Pathway NEF: Engineering design	601/4564/XNEF
Pathway NEG: Fluidics	601/4564/XNEG

For further information please contact EAL Customer Services +44 (0)1923 652 400.

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