



End-point assessment plan for Electronic Systems Principal Engineer apprenticeship standard

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ST0681	7	No

Contents

Introduction and overview	2
EPA summary table	3
Length of end-point assessment period:.....	5
Order of assessment methods.....	5
Gateway	5
Assessment Methods	7
Weighting of assessment methods	12
Grading.....	13
Roles and responsibilities	18
Internal Quality Assurance (IQA)	19
Re-sits and retakes.....	19
Affordability.....	20
Professional body recognition.....	20
Reasonable adjustments	20
Mapping of KSBs.....	21

Introduction and overview

This document sets out the requirements for end-point assessment (EPA) for the Electronic Systems Principal Engineer apprenticeship standard. It is for end-point assessment organisations (EPAOs) who need to know how EPA for this apprenticeship must operate. It will also be of interest to Electronic Systems Principal Engineer apprentices, their employers and training providers.

Full time apprentices will typically spend 36 months on-programme (before the gateway) working towards the occupational standard, with a minimum of 20% off-the-job training. All apprentices will spend a minimum of 12 months on-programme.

The EPA period should only start, and the EPA be arranged, once the employer is satisfied that the apprentice is consistently working at or above the level set out in the occupational standard, all of the pre-requisite gateway requirements for EPA have been met and that they can be evidenced to an EPAO.

All pre-requisites for EPA assessment methods must also be complete and available for the assessor as necessary.

For Level 3 apprenticeships and above, apprentices without English and mathematics at Level 2 must achieve Level 2 prior to taking their EPA.

The EPA must be completed within an EPA period lasting a maximum of eight months, beginning when the apprentice has met the EPA gateway requirements.

The EPA consists of two distinct assessment methods:

Assessment Method 1: Technical work-based project with report and presentation with questions

- Fail
- Pass
- Distinction

Assessment Method 2: A professional discussion, supported by a portfolio of evidence.

- Fail
- Pass
- Distinction

Performance in the EPA will determine the overall apprenticeship standard and grade of:

- Fail
- Pass
- Distinction

EPA summary table

On-programme (typically 36 months)	Training to develop the occupation standard's knowledge, skills and behaviours.
End Point Assessment Gateway	<ul style="list-style-type: none"> • Employer is satisfied the apprentice is consistently working at, or above, the level of the occupational standard. • English/mathematics Level 2 <p>Employer and apprentice must:</p> <ul style="list-style-type: none"> • Agree the subject, title and scope of a Technical Work-based project with the EPAO. <p>Apprentice must:</p> <ul style="list-style-type: none"> • Produce a portfolio of evidence referencing the relevant KSBs as outlined in the mapping for the professional discussion assessment method • Obtain confirmation from employer that the apprentice is working at the level of, or above, the requirements of the occupational standard.
End Point Assessment (which would typically take eight months)	<p>Assessment Method 1: Technical work-based project with report and presentation with questions</p> <p>With the following grades:</p> <ul style="list-style-type: none"> · Fail · Pass · Distinction <p>Assessment Method 2: A professional discussion, supported by a portfolio of evidence.</p> <p>With the following grades:</p> <ul style="list-style-type: none"> · Fail · Pass · Distinction <p>Overall EPA/apprenticeship graded:</p>

	<ul style="list-style-type: none">· Fail· Pass· Distinction
Professional recognition	Partially aligns with recognition by: <ul style="list-style-type: none">• The Engineering Council as a Chartered Engineer (CEng).

Length of end-point assessment period:

The EPA (including all assessment methods) must be completed within eight months of the Gateway.

Order of assessment methods

The assessment methods can be delivered in any order. The result of one assessment method does not need to be known before taking the next.

Gateway

The EPA period should only start once the employer is satisfied that the apprentice is consistently working at or above the level set out in the occupational standard, that is to say they are deemed to have achieved occupational competence. In making this decision, the employer may take advice from the apprentice's training provider(s) but ultimately the decision must be made solely by the employer.

In addition to the employer's confirmation that the apprentice is working at or above the level in the occupational standard, the apprentice must have completed the following gateway requirements prior to beginning EPA:

English and Mathematics at Level 2.

For those with an education, health and care plan or a legacy statement the apprenticeships English and mathematics minimum requirement is Entry Level 3 and British Sign Language qualification are an alternative to English qualifications for whom this is their primary language.

For the Technical Work Based Project:

- the apprentice, employer and EPAO must have agreed the project's subject, title and scope.

For the Professional Discussion, supported by a portfolio of evidence, the apprentice will be required to:

- submit a portfolio of evidence mapping experience against those KSBs that are being assessed by this method.
- each piece of evidence may map to more than one KSB, this will typically result in 8-10 pieces of evidence to cover all KSBs listed.
- provide confirmation from their employer that the apprentice is working at the level of, or above, the apprenticeship standard. The employer must sign off the portfolio of evidence, thereby authenticating it and confirming that the apprentice is ready to take the EPA.

- the portfolio of evidence itself is not assessed, it is used to inform the questioning in the professional discussion.
- the portfolio of evidence may also be used, subsequently, to support the evidence requirements for professional registration at CEng, should the apprentice wish to apply.
- apprentices must compile a portfolio of evidence during the on-programme period of the apprenticeship
- employers/training providers are free to devise their own version of the portfolio of evidence which can be electronic, but the portfolio of evidence would typically contain the following information:
 - The name of the apprentice
 - Details of the apprentice's workplace
 - Sufficient evidence to support each of the KSBs related to this assessment method.
 - Evidence can be provided through a range of sources, for example: performance review documentation, witness statements, training records/certificates and work products such as risk assessments, reports, meeting records, plans etc. For behavioural competencies, the portfolio of evidence cannot include self-assessment narrative, other than records of learning activities targeting their own professional development; instead, feedback from line managers, customers, stakeholder etc. should be provided. Ideally, any employer contributions should focus on direct observation of evidence (e.g. witness statements) of competence rather than opinions.
 - Confirmation from the apprentice's line manager that the tasks were completed to the required standard of the organisation

Assessment Methods

Assessment Method 1: Technical work-based project with report and presentation with questions

This assessment method has two components: A technical work-based project with report; and a presentation with questions

Method 1 Component 1: technical work-based project with report

Overview

The rationale for this assessment method is:

- it provides an opportunity for the apprentice to demonstrate that the relevant KSBs on the occupational standard, particularly their technical understanding, engineering knowledge and problem solving are at the required level
- it typically reflects the types of projects in a format that would usually be completed by electronic systems principal engineers.

Delivery

The project is undertaken after the apprentice has gone through the Gateway process. The project will be a work-based assignment and should be designed to ensure that the apprentice's work meets the needs of the business, is relevant to their role and allows the relevant KSBs to be demonstrated for the EPA. Therefore, the project's subject, title and scope will be agreed between the apprentice, employer and the EPAO at gateway. The employer will ensure it has a real business application and the EPAO will ensure it meets the requirements of the EPA (including suitable coverage of the KSBs assigned to this assessment method).

Apprentices will complete an assignment in the form of a work-based project. The project must be appropriate for a Level 7 apprenticeship, technically focused and should demonstrate competence against the knowledge skills and behaviours that are mapped to this assessment method.

The technical work based project will include:

1. Project scope, planning & resources.
 - a. Definition of the scientific business context to the design project including perceived advantages & limitations.
 - b. Clear project plan and predicted timescales.
 - c. Consideration of resources and regulations with particular attention to relevant process safety requirements, product quality and assessment of risk.

2. Problem definition and data analysis.
 - a. Understanding of process/plant engineering drawings relevant to the problem statement.
 - b. Description of equipment and/or facilities involved, constraints and risks.
 - c. Analysis of scientific information, engineering data and design calculations pertinent to project.
3. Design solution, implementation or simulation.
 - a. Presentation of design solution including updated engineering drawings/calculations and use of appropriate engineering informatics packages.
 - b. Documented implementation or simulation of proposed design solution including real/simulated data.
 - c. Predicted or actual processing equipment and plant performance.
4. Business impact, results and conclusions.
 - a. Reporting of the results of the design implementation.
 - b. Business implications of the design solution including basic understanding of financial implications and an economic impact analysis.
 - c. Conclusions.

The technical work based project is completed after the apprentice has gone through the Gateway process. The apprentice will typically complete their project within a window of 4-6 months of the EPA start date. The employer will ensure the apprentice has sufficient time and the necessary resources, within this period, to plan and undertake the project. The employer will appoint a Technical Expert who will act as the project supervisor, in line with the structure of the organisation. The Technical Expert cannot assist the apprentice during the project; the project must be their own work.

The project may be based on any of the following:

- a specific design-related problem.
- a recurring issue.
- an idea/opportunity.

A technical work-based report about the project must be produced. The report should comprise of 4,000 words (+/-10%) (excluding any annexes and appendices) and as a minimum the report must include:

- introduction
- justification/business case
- scope of the project (including key performance indicators)
- methods (how the outcomes were achieved)
- a project plan
- research

- outcomes and results.
- recommendations and conclusions
- annex providing evidence relating to the technical project activity, which must be must be referenced in the report. The following list is not exhaustive and other evidence sources are permissible. However, self-reflective accounts and witness testimonies are not valid evidence sources. Typically, there may be between 5-10 pieces of supporting evidence. Evidence could include:
 - working notes
 - work records
 - video clips (maximum 15 minutes in total)
 - annotated photographs of completed work or work in progress
 - diagrams
 - job write up
 - calculations
 - fault diagnosis records
 - data reports
 - build specifications
 - quality/compliance records
- appendix containing:
 - mapping of the report and supporting evidence against the KSBs being assessed by this assessment method.
 - a statement from the technical expert confirming that the report and evidence is the apprentice's own work and authenticating the project outcomes.

Marking

The technical work-based report is assessed as part of the overall project; its main purpose is to provide context and background (see Component 2 below). It must be submitted to the EPAO at least 2 weeks ahead of the presentation component. The independent assessor will review the technical project report ahead of the presentation component.

Method 1 Component 2: project presentation, with questions

Overview

After the project report has been submitted, apprentices will prepare and deliver a short overview presentation, based on their technical work-based project undertaken during the EPA period that appropriately covers the KSBs assigned to this method of assessment. The

presentation will introduce their project and report, and be delivered to the independent assessor, either face-to-face or via online video conferencing. If using an online platform, EPAOs must ensure appropriate measures are in place to prevent misrepresentation and ensure that the apprentice is not being aided in anyway, by using a 360-degree camera.

The independent assessor will not formally review the presentation in advance.

Delivery

The presentation, which is designed to provide a short overview of the technical work-based project. To deliver the presentation, the apprentice may use the following and should confirm their requirements with the EPAO ahead of the presentation:

- audio visual equipment
- flip charts
- videos
- interactive demonstrations
- notes
- computer

There are no restrictions on how apprentices deliver the presentation or support resources/materials used. If PowerPoint (or similar) is used, it is anticipated that the presentation will typically consist of 6-10 slides.

Following the presentation, the independent assessor will ask a minimum of five questions based on the project/problem report and presentation. The questions will come from a combination of a review of the project report and the EPAO question bank. They will also be able to ask follow-up, open, questions to probe or seek further clarification. The presentation and questioning will take a maximum of one hour with the presentation typically taking 15 minutes and the questioning typically taking 45 minutes. However, the independent assessor has the discretion to increase the time of the questioning by up to 10% to allow the apprentice to complete their last answer. The independent assessor will maintain a record of the questions and key points of the answers. The independent assessor will make all grading decisions.

Venue

EPAOs must ensure that the presentation and questioning elements are conducted in a suitable controlled environment at either the employer's premises or any other suitable venue selected by the EPAO (e.g. a training provider).

The venue should be a quiet room, free from distraction and external influence, equipped with Wi-Fi and suitable AV equipment.

Other relevant information

Representation from the employer, in the form of a technical expert, may also be present. However, they are **only to observe** and to provide any additional explanation/clarification requested by the independent assessor. The employer representative must not have been involved in the learning or training of the apprentice. Their role is to provide technical support, advice and guidance such as confirming company policies, procedures, processes, providing context on technical information or on emerging technologies. They must not provide information on behalf of the apprentice, ask the apprentice questions or influence the apprentice in any way. The employer representative must not amplify or clarify points made by the apprentice. Any information provided by the employer representative must only be at the request of the end-point assessor who has the final say over the assessment and grade awarded.

EPAOs must ensure that apprentices complete a different project in the case of re-takes.

Support material

EPAOs will produce the following material to support this assessment method: Marking criteria, checklists and feedback template.

Assessment Method 2: A professional discussion, supported by a portfolio of evidence

This assessment method has one component: A professional discussion

Overview

The rationale for this assessment method is:

- an appropriate method of assessing wider occupational competency and a range of KSBs
- determines the extent to which the apprentice understands the requirements of the role and can corroborate their KSBs with examples from their portfolio of evidence
- gives the independent assessor the opportunity to explore KSBs in detail and ensures that all relevant competency elements are evidenced
- the most effective way of determining competence in the majority of behavioural elements of this standard

Delivery

This assessment will take the form of a professional discussion. The discussion will be appropriately structured to allow the apprentice to demonstrate professional competence for all of the KSBs assigned to this assessment method.

The independent assessor will conduct and assess the professional discussion, which will last for 50 minutes. The assessor has the discretion to increase the time of the professional discussion by up to 10% to allow the apprentice to complete their last answer. Further time may be granted for apprentices with appropriate needs, in-line with the EPAO's Reasonable Adjustments policy.

The independent end-point assessor must ask the apprentice a minimum of 6 questions. Prior to the professional discussion, the independent end-point assessor will develop questions using a combination of those drawn from a question bank prepared by the EPAO and those generated themselves, tailored following their review of the portfolio of evidence. Questions must cover underpinning KSBs as specified in the mapping document. Supplementary questions are allowed to seek clarification. Apprentices may refer to their portfolio of evidence when answering the questions.

Video conferencing can be used to conduct the professional discussion, but the EPAO must have processes in place to verify the identity of the apprentice and ensure the apprentice is not being aided in some way, by using a 360-degree camera.

The independent assessor must use the assessment tools and procedures that are set by the EPAO to record the professional discussion. The independent assessor will make all grading decisions.

Venue

The professional discussion should take place in a quiet room, free from distractions, at either the employer's premises or any other suitable venue selected by the EPAO (e.g. a training provider).

Other relevant information

A question bank must be developed by EPAOs. The 'question bank' must be of sufficient size to prevent predictability and the EPAO must review it regularly (and at least once a year) to ensure that it, and its content, are fit for purpose. The questions relating to the underpinning knowledge, skills and behaviours, must be varied yet allow assessment of the relevant KSBs.

EPAOs must ensure that apprentices have a different set of questions in the case of re-sits/re-takes.

Independent assessors must be developed and trained by the EPAO in the conduct of professional discussions and reaching consistent judgement.

Weighting of assessment methods

All assessment methods are weighted equally in their contribution to the overall EPA grade.

Grading

The tables below show the detailed grading criteria for each assessment component (the technical work-based project and professional discussion) of the End Point Assessment. The criteria define the minimum level of competence required to achieve a Pass or Distinction. They have been grouped into “themes” covering a number of the Knowledge, Skills and Behaviours from the Standard. The apprentice will be deemed to fail if they do not meet all criteria required to achieve a Pass. Independent assessor decisions must be subject to moderation. Grades must not be confirmed until after moderation.

Assessment Method 1: Technical Work-based Project with report, presentation and questioning

Fail	Pass	Distinction
Does not meet the pass grading criteria	Apprentice meets all the pass grading criteria	Apprentice meets all the pass grading criteria and all the distinction grading criteria

Themes and Mapping to KSBs	Pass Criteria	Distinction Criteria
<p>A theoretical approach to the application of existing and emerging technology in Electronic Engineering.</p> <p>KSBs: K1, K2.</p>	<p>Demonstrates a comprehensive theoretical understanding of Electronics</p> <p>Explains how they introduce or exploit new technologies using an example from their own field.</p>	
<p>An evidenced based approach to engineering problem solving</p> <p>KSBs: S1, S2.</p>	<p>Gathers information about requirements and performance; uses analytical processes to establish needs or recognise shortcomings.</p> <p>Demonstrates optimisation issues (e.g. failure rates, root cause analysis) and how to measure improvements.</p> <p>Demonstrates commitment to continuous improvement.</p>	<p>Provides evidence of personally identifying potential projects, opportunities or technological improvements.</p> <p>Compares outputs from a minimum of problem solving techniques to interpret information and analyse their benefits.</p> <p>Demonstrates insight about how innovation and best practice is applied to improve outcomes and the effectiveness of solutions.</p>

<p>Manage and organise tasks and self, works collaboratively</p> <p>KSBs: S4, B1, B4i.</p>	<p>Agrees objectives and create plans, monitors and reports progress. Ensures variations are identified and that corrective action is taken.</p> <p>Discusses collaborative working techniques and how they can be selected, applied and critiqued.</p>	
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Assessment Method 2: A professional discussion, supported by a portfolio of evidence

Fail	Pass	Distinction
Does not meet the pass grading criteria	Apprentice meets all the pass grading criteria	Apprentice meets all the pass grading criteria and at least two of the distinction grading criteria boxes (i.e. fully meets all the distinction criteria within each KSB theme)

Themes and Mapping to KSBs	Pass Criteria	Distinction Criteria
<p>Conduct appropriate research and engage in innovative design and development of Electronics.</p> <p>KSBs: K3, S3.</p>	<p>Conducts theoretical and applied research. Undertakes analysis of customer requirements or product design.</p> <p>Prepares and presents design recommendations with appropriate analysis of cost, quality, safety, reliability and security that also take account of external technological developments.</p> <p>Describes intellectual property (IP) constraints and opportunities.</p>	<p>Demonstrates that they will have played a leading role in researching and carrying out design and development of Electronic solutions.</p> <p>Demonstrates creativity and an innovative approach. For example, working as a lead engineer in a project team delivering novel and leading-edge designs or solutions.</p>
<p>Deliver electronic engineering solutions effectively and efficiently.</p> <p>KSBs: K5, K6, S5, S8, S9.</p>	<p>Implements design solutions, taking account of wider business/economic considerations and legal and/or regulatory constraints.</p> <p>Makes decisions in relation to timescales and cost but</p>	<p>Leads and manages the implementation of design solutions through into product or service realisation (often of complex projects).</p> <p>Accountable for performance factors and quality. Evaluates products and solutions against success criteria agreed with</p>

	<p>with some support of a more senior colleague.</p> <p>Assumes responsibility for the work of other (junior) members of the team.</p> <p>Determines evaluation criteria and evaluates outcomes against specification. Actively learns from feedback.</p>	<p>stakeholders and in terms of strategic requirements.</p>
<p>Show safe, ethical and professional working practices</p> <p>KSBs: K4, B2, B6.</p>	<p>Demonstrates consistent, safe and professional working practices, in line with regulatory frameworks, codes of conduct and within ethical boundaries.</p> <p>Demonstrates a professionalism approach, respecting others, promoting inclusion and acting ethically.</p>	
<p>Demonstrate effective interpersonal and communication skills, and commitment to personal and professional development.</p> <p>KSBs: S6, S7, B3, B4ii, B5.</p>	<p>Presents ideas and proposals in a comprehensive and legible manner. Prepares documents and reports on complex technical matters.</p> <p>Exchanges information and provides advice to both technical and non-technical colleagues.</p> <p>Demonstrates promotion of diversity, inclusion and equality.</p> <p>Carries out and records personal professional development activities.</p>	<p>Demonstrates how they have used a range of effective communication techniques and can evaluate how they have successfully influenced colleagues/stakeholders.</p> <p>Demonstrates how they are trusted to represent others in their area of work at meetings and in negotiations, for example making formal presentations on behalf of themselves and others and make a positive impact in meetings and negotiations.</p> <p>Provides evidence of their personal and social skills, which contribute to the creation</p>

	<p>Ensures that CPD plan is kept up to date and can provide at least two examples of previous CPD activities.</p> <p>Explains how learning and reflective techniques have been applied.</p>	<p>of productive working relationships.</p> <p>Demonstrates a positive mind-set and willingness to learn, displaying proactive approach and the ability to take the initiative when it comes to personal CPD.</p>
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Overall EPA grading. All EPA methods must be passed for the EPA to be passed overall. Grades from individual assessment methods should be combined in the following way to determine the grade of the EPA as a whole:

Work Based Project	Professional Discussion	Overall grading
Fail	Fail	Fail
Fail	Pass	Fail
Pass	Fail	Fail
Pass	Pass	Pass
Pass	Distinction	Pass
Distinction	Pass	Pass
Distinction	Distinction	Distinction

Roles and responsibilities

Role	Responsibility
Apprentice	<ul style="list-style-type: none"> • complete the on-programme element of the apprenticeship • prepare for and complete the EPA, including: project overview report, presentation and portfolio of evidence.
Employer/Technical Expert	<p>Employer:</p> <ul style="list-style-type: none"> • identify when the apprentice is ready to pass the gateway and undertake their EPA. • notify the EPAO that the apprentice has passed the gateway and of the scope of the EPA project. <p>Employer's Technical Expert:</p> <ul style="list-style-type: none"> • observe the presentation and questioning assessment method, providing any technical advice/clarification as requested by the Independent Assessor.
EPAO	<p>As a minimum EPAOs should:</p> <ul style="list-style-type: none"> • appoint administrators/invigilators and markers to administer/invigilate and mark the EPA • provide training and CPD to the independent assessors they employ to undertake the EPA • agree scope of EPA project with employer and apprentice. • Create learner specifications detailing the EPA, process, content etc. • ensure there is no direct connection with the apprentice, their employer or training provider i.e. there must be no conflict of interest • have processes in place to conduct internal quality assurance and do this on a regular basis • organise standardisation events and activities in accordance with this plan's IQA section • organise and conduct moderation of independent assessors' marking in accordance with this plan • have, and operate, an appeals process • conform to the requirements of the nominated EQA provider
Independent assessor	<p>As a minimum an Independent assessor should:</p> <ul style="list-style-type: none"> • be independent of the apprentice, their employer and training provider(s) i.e. there must be no conflict of interest • have the capability to assess the apprentice at this level i.e. meet the occupational requirements as set out in the IQA section of this assessment plan

	<ul style="list-style-type: none"> • attend the required number of EPAO's standardisation and training events per year (as defined in the IQA section)
Training provider	<p>As a minimum the training provider should:</p> <ul style="list-style-type: none"> • work with the employer to ensure that the apprentice is given the opportunities to develop the KSBs outlined in the standard and monitor their progress during the on-programme period • advise the employer, upon request, on the apprentice's readiness for EPA prior to the gateway • Plays no part in the EPA itself

Internal Quality Assurance (IQA)

Internal quality assurance refers to the requirements that EPA organisations must have in place to ensure consistent (reliable) and accurate (valid) assessment decisions. EPA organisations for this EPA must:

- appoint independent assessors who have knowledge of the following areas: Electronic Systems, ideally in a sector relevant to the apprentice and employer.
- appoint independent assessors who have recent relevant experience of the occupation/sector gained in the last five years.
- The assessor must have the following minimum skills, knowledge and occupational competence:
 - Qualified at Level 7.
 - Have significant relevant experience in the sector.
 - Be training in competency-based assessment methods.
 - It is also desirable but not essential that the assessors are professional registered at Chartered level e.g. CEng, CMgr or CITP.
- provide training for independent assessors in terms of good assessment practice, operating the assessment tools and grading
- have robust quality assurance systems and procedures that support fair, reliable and consistent assessment across the organisation and over time.
- operate induction training and standardisation events for independent assessors when they begin working for the EPAO on this standard and before they deliver an updated assessment method for the first time.

Re-sits and retakes

Apprentices who fail one or more assessment method will be offered the opportunity to take a re-sit or a re-take. A re-sit does not require further learning, whereas a re-take does.

Apprentices should have a supportive action plan to prepare for the re-sit or a re-take. The apprentice's employer will need to agree that either a re-sit or re-take is an appropriate course of action.

An apprentice who fails an assessment method, and therefore the EPA in the first instance, will be required to re-sit any failed assessment methods only.

The timescales for a resit/retake is agreed between the employer and EPAO. A resit is typically taken within 3 months of the EPA outcome notification. The timescale for a retake is dependent on how much re-training is required and is typically taken within 6-12 months of the EPA outcome notification.

Re-sits and re-takes are not offered to apprentices wishing to move from pass to distinction.

Where any assessment method has to be re-sat or re-taken, the apprentice will be awarded a maximum EPA grade of Pass, unless the EPAO determines there are exceptional circumstances requiring a re-sit or re-take.

Affordability

The following factors should ensure the EPA is affordable:

- Employers' premises can be used for EPA venues where possible.
- Remote assessment is permissible e.g. video conferencing so reducing travel costs.
- The work based project about on real work completed for the apprentice's employer, adding value to the employer.

Professional body recognition

This apprenticeship is designed to prepare successful apprentices to meet the requirements for professional registration as a Chartered Engineer. The Standard has been partially aligned to the UK-SPEC, published by the Engineering Council, for professional engineering competence at the Chartered level.

Reasonable adjustments

The EPAO must have in place clear and fair arrangements for making Reasonable Adjustments for this standard. This should include how an apprentice qualifies for Reasonable Adjustment and what Reasonable Adjustments will be made. The adjustments must maintain the validity, reliability and integrity of the assessment methods outlined in this assessment plan.

Mapping of KSBs

Assessment Method	Key
Work Based Project	WBP
Professional Discussion	PD

KSB code	KSB statement	Methods mapped against
K1	Advanced concepts in specialist areas of electronic engineering such as Microelectronics Systems Design, Embedded Systems, Microelectronics, Real Time Computing, Nano Technologies, Photonic Technologies, Radio Frequency and Wireless Communications.	WBP
K2	How to apply theoretic understanding to analyse complex problems in both existing and emerging electronic technologies to deliver innovative engineering solutions.	WBP
K3	State of the art techniques, tools and methodologies used in the design, realisation, verification and testing of Electronic Systems.	PD
K4	Regulatory and compliance frameworks, international standards, codes of practice and protocols relevant to Electronic Systems.	PD
K5	Wider socio-economic factors, organisational context and wider business environment.	PD
K6	Legal and commercial aspects relating to Electronic Systems, for instance Intellectual Property and patents.	PD
S1	Evaluate complex technical information to draw rational conclusions and to make informed decisions.	WBP
S2	Apply systems thinking and methodology to problem solving.	WBP
S3	Assess impact of external changes and technological developments.	PD
S4	Organise and plan engineering projects and tasks.	WBP

S5	Manage budgets and control technical resources.	PD
S6	Communicate effectively and professionally with all levels.	PD
S7	Develop and maintain effective working relationships and is able to interact and influence a range of internal and external stakeholders.	PD
S8	Lead teams and manage staff.	PD
S9	Apply effective time management techniques and be able to multi-task whilst meeting deadlines.	PD
B1	Self-motivated and is able to work independently.	WBP
B2	Able to take responsibility for their actions, demonstrates resilience and acts with integrity.	PD
B3	Be a reflective engineering practitioner, who is committed to their own personal learning and professional development.	PD
B4	i. Works collaboratively; ii. an enabler who willingly shares knowledge and experience.	B4i. WBP B4ii. PD
B5	Promotes diversity, inclusion and equality.	PD
B6	Complies with relevant Codes of Conduct and exercises responsibilities in a safe, sustainable and ethical manner.	PD