Institute for Apprenticeships & Technical Education

End-point assessment plan for Software Development Technician apprenticeship standard

Apprenticeship standard reference number	Apprenticeship standard level	Integrated end-point assessment
ST0128	3	No

Contents

Introduction and overview

This document sets out the requirements for end-point assessment (EPA) for the Software Development Technician apprenticeship standard. It explains how EPA for this apprenticeship must operate.

It provides the EPA design requirements for end-point assessment organisations (EPAOs). It will also be useful for apprentices undertaking this apprenticeship, their employers and training providers.

EPA must be conducted by an EPAO approved to deliver EPA for this apprenticeship standard. Each employer should select an approved EPAO from the Education & Skills Funding Agency's Register of end-point assessment organisations (RoEPAO).

Full-time apprentices will typically spend 18 months on-programme (before the gateway) working towards this occupational standard. All apprentices must spend a minimum of 12 months on-programme. All apprentices must spend a minimum of 20% of on-programme time undertaking off-the-job training.

Before starting EPA, an apprentice must meet the gateway requirements. For this apprenticeship they are:

- the employer must be content that the apprentice is working at or above the occupational standard
- apprentices must have compiled and submitted a portfolio of evidence to underpin the professional discussion.
- apprentices must have achieved English and mathematics at Level 2[1]

The EPAO must confirm that all required gateway evidence has been provided and accepted as meeting the gateway requirements. The EPAO is responsible for confirming gateway eligibility. Once this has been confirmed, the EPA period starts.

This EPA should then be completed within an EPA period lasting typically for three months.

This EPA consists of two discrete assessment methods.

It will be possible to achieve the following grades in each assessment method:

Assessment method 1: Project report with questioning

- fail
- pass
- distinction

Assessment method 2: Professional discussion underpinned by portfolio.

- fail

[1] For those with an education, health and care plan or a legacy statement, the apprenticeship's English and Mathematics minimum requirement is Entry Level 3. British Sign Language (BSL) qualifications are an alternative to English qualifications for those who have BSL as their primary language.

- pass
- distinction

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

- fail
- pass
- merit
- distinction

EPA summary table

On-programme (typically, 18 months)	Training to develop the knowledge, skills and behaviours (KSBs) of the occupational standard. Training towards English and mathematics Level 2, if required. Compiling a portfolio of evidence.
End-point assessment gateway	The employer must be content that the apprentice is working at or above the occupational standard. Apprentices must have achieved English and mathematics Level 2. Apprentices must submit a portfolio of evidence to underpin the professional discussion.
End-point assessment (which will typically take 3 months)	Assessment method 1: **Project report with questioning** With the following grades: · fail · pass · distinction Assessment method 2: **Professional discussion underpinned by portfolio.** With the following grades: · fail · pass · distinction Performance in the EPA will determine the overall apprenticeship standard grade of: · fail · pass · merit · distinction
Professional Recognition	n/a

Length of end-point assessment period

The EPA will be completed within an EPA period lasting typically three months, starting when the EPAO has confirmed that all gateway requirements have been met.

The EPA period must last for a minimum of one week.

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 starting the next.

EPA gateway

The apprentice should only enter the gateway once the employer is content that the apprentice is working at or above the occupational standard. In making this decision, the employer may take advice from the apprentice's training provider(s), but the decision must ultimately be made solely by the employer.

The EPAO determines when all other gateway requirements have been met, and the EPA period will only commence once the EPAO has confirmed this.

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:

- achieved English and mathematics at Level 2.
  For those with an education, health and care plan or a legacy statement, the apprenticeship's English and Mathematics minimum requirement is Entry Level 3. British Sign Language (BSL) qualifications are an alternative to English qualifications for those who have BSL as their primary language.

For Project report with questioning:

- no specific requirements

For professional discussion underpinned by portfolio, the apprentice will be required to submit:

- portfolio of evidence

Portfolio of evidence requirements:

- apprentices must compile a portfolio of evidence during the on-programme period of the apprenticeship.
- it must contain evidence related to the KSBs that will be assessed by the professional discussion.
- the portfolio of evidence will typically contain ten discrete pieces of evidence
- evidence should be mapped by the apprentice against the KSBs assessed by the professional discussion (see mapping of KSBs)
- evidence may be used to demonstrate more than one KSB; a qualitative as opposed to quantitative approach is suggested.
- evidence sources may include:
  - workplace documentation, for example workplace policies/procedures, records
  - witness statements
  - annotated photographs
  - video clips (maximum total duration 10 minutes); the apprentice must always be in view and identifiable.

  This is not a definitive list; other evidence sources are possible.
- it should not include any methods of reflective accounts and self-assessment.
- any employer contributions should focus on direct observation of performance (for example witness statements) rather than opinions.

- the evidence provided must be valid and attributable to the apprentice; the portfolio of evidence must contain a statement from the employer and apprentice confirming this.
- the portfolio of evidence must be submitted to the EPAO at the gateway.

The portfolio is not directly assessed. It underpins the professional discussion and therefore should not be marked by the EPAO. EPAOs should review the portfolio in preparation for the professional discussion but are not required to provide feedback after this review of the portfolio.

End-point assessment methods

Assessment method 1: Project report with questioning

This assessment method has 2 components.

Assessment method 1 component 1: Project report

Overview

The project is compiled after the apprentice has gone through the gateway.

The work-based project 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 employer and the EPAO. 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 as shown in the mapping of assessment methods.

Given the large number of projects that will be completed per year, EPAOs will not be expected to sign-off each project title before the project commences. However, the EPAO should instead provide detailed specifications and suggested project titles to enable the employer to select a project post-gateway that will meet the requirements of the EPA.

The rationale for this assessment method is:

Software Development Technicians operate in a project-based environment and so will be familiar with reporting on software development activities in their day-to-day work.

Delivery

Apprentices will conduct a project in the form of a report.

The project is compiled after the apprentice has gone through the gateway. The apprentice will conduct their project and submit it to the EPAO after 4 weeks 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.

Whilst completing the project, the apprentice should be subject to the supervision arrangements outlined below:

- normal workplace supervision.

The project should be based upon a customer or stakeholder specification requiring the apprentice to respond to any of the following:

- a specific problem
- a recurring issue
- an idea/opportunity

For example, the project may focus on a software development problem within a wider project or a recurring issue within an existing software product. The project may also focus on new ways to deliver

software outcomes to improve performance of a piece of software or innovate, for example prototype testing. It does not have to cover the full software development life cycle.
The project report should be in the form of an electronic report comprising narrative, one or more artefacts, and visual infographics as necessary.

As a minimum all projects must include the following sections:

- an introduction
- the scope of the project (including key performance indicators)
- analysis and problem solving in response to challenges within the project
- research and findings
- project outcomes including artefacts comprising examples of relevant coding undertaken and visual infographics conveying the software solution and design of the software development outputs sufficient to demonstrate the KSBs assigned to this method
- recommendations and conclusions
- an explanation of how the stages of the software development lifecycle which are involved in the project have been evidenced e.g.
    - planning
    - analysis
    - design
    - implementation/build
    - test
    - deploy
    - maintain

The project report has a word limit of 3,000. A tolerance of plus or minus 10% is allowed. Appendices, references and diagrams will not be included in this total and must include artefacts such as examples of code and may include infographics and visualisations to show how the relevant software project outcomes are given effect.

The project must map, in an appendix, how it evidences the relevant KSBs for this assessment method.

The apprentice should complete their project unaided. When the project report is submitted, the employer and the apprentice must verify that the submitted project is the apprentice's own work.

The independent assessor will review and assess the project report holistically together with the other components of this assessment method.

The independent assessor will make all grading decisions.

Assessment method 1 component 2: Questioning

Overview

This component will take the form of questioning, based on the project report, which must be appropriately structured to draw out the best of the apprentice's competence and excellence and cover the KSBs assigned to this assessment method. It will involve the questions that will focus on the content of the project report.

The rationale for this assessment method is:

This will allow real work to be used to demonstrate some KSBs which may take too long to observe to be assessed. This will enable the apprentice to draw out KSBs that have arisen during the project in more depth.

Delivery

The independent assessor will conduct the questioning and assess responses provided by the apprentice. The apprentice will have 2 weeks' notice of the questioning.

The questioning must last for 40 minutes. The independent 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.

During this method, the independent assessor will use questions from the EPAO question bank.

The questioning will be conducted using the project report as a basis. A minimum of ten questions must be asked relevant to the areas of the report which require more detail or explanation. The independent assessor must use the assessment tools and procedures that are set by the EPAO to record the questioning.

The independent assessor will make all grading decisions holistically, based on the project report and answers to questioning.

Assessment location

The questioning should take place in a quiet room, free from distractions and influence.

The questioning can take place in any of the following:

- employer's premises
- a suitable venue selected by the EPAO (for example a training provider's premises)
- online using video conferencing

The questioning may be conducted face-to-face or via an electronic platform e.g. video conferencing. EPAOs must ensure appropriate methods to prevent misrepresentation are in place.

Question and resource development

EPAOs will create and set open questions to assess KSBs mapped to this assessment method. Each EPAO must develop a question bank of sufficient size to prevent predictability and review them regularly (and at least once a year) to ensure the questions they contain are fit for purpose. Independent assessors must use the question bank as a source for questioning and are expected to use their professional judgment to tailor those questions appropriately. Independent assessors are responsible for generating suitable follow-up questions in line with the EPAO's training and standardisation process. The questions relating to underpinning KSBs 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 questioning and reaching consistent judgement.

EPAOs will produce the following material to support this assessment method:

- outline of the assessment method's requirements.
- marking materials

Supporting material

EPAOs will produce the following material to support this assessment method:

• Outline of the assessment method's requirements
• Marking materials
• Examples of projects

Assessment method 2: Professional discussion underpinned by portfolio

This assessment method has 1 component.

Assessment method 2: Professional discussion underpinned by portfolio

Overview

This assessment will take the form of a professional discussion which must be appropriately structured to draw out the best of the apprentice's competence and excellence and cover the KSBs assigned to this assessment method. A professional discussion is a two-way discussion which involves both the independent assessor and the apprentice actively listening and participating in a formal conversation. It gives the apprentice the opportunity to make detailed and proactive contributions to confirm their competency across the KSBs mapped to this method.

The rationale for this assessment method is:

The professional discussion was selected as a valid way to draw out KSBs, in particular behaviours. It allows for a range of examples to be brought forward during the two-way conversation and ensures that excellence can be achieved and acknowledged. This method is cost effective, as it can be conducted remotely to reduce travelling time.

Delivery

The independent assessor will conduct and assess the professional discussion.

The professional discussion must last for 60 minutes. The independent 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 professional discussion will be conducted as set out here:

- The professional discussion is a structured two-way conversation between the apprentice and an independent assessor.
- The professional discussion must be appropriately structured to draw out the best of the apprentice's competence and excellence.

The portfolio is submitted to the EPAO at the gateway. The independent assessor should have two weeks prior to the professional discussion to review the portfolio. A copy should be retained by the apprentice and brought by them to the professional discussion.

Independent assessors must use the question bank as a source for questioning and are expected to use their professional judgment to tailor those questions appropriately. Questions can also be generated by the assessor based on the portfolio. Independent assessors will ask a minimum of 15 questions and may ask further questions for clarification purposes and to allow the apprentice the opportunity to cover the KSBs mapped to this assessment method.

The portfolio will be used by the apprentice to refer to exemplify a point. Questioning will be used to authenticate evidence, experience, and competence.

The professional discussion should be graded fail, pass or distinction. The portfolio underpins the professional discussion and will not be assessed or graded. Independent assessors must allocate grades using the grading criteria.

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

KSBs met and answers to questions, must be recorded by the independent assessor.

The independent assessor will make all grading decisions.

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

Assessment location

The professional discussion should take place in a quiet room, free from distractions and influence.

The professional discussion can take place in any of the following:

- employer's premises
- a suitable venue selected by the EPAO, for example a training provider's premises
- video conferencing

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.

Question and resource development

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 (at least once a year) to ensure that it, and its content, are fit for purpose. The questions relating to the underpinning KSBs, must be varied yet

allow assessment of the relevant KSBs. Independent assessors must use the question bank as a source for questioning and are expected to use their professional judgment to tailor those questions appropriately. Independent assessors are responsible for generating suitable questions in line with the EPAO's training and standardisation process.

EPAOs will produce the following material to support this assessment method:

- question bank
- structured specification
- outline of the assessment method's requirements.
- assessment recording documentation
- marking materials
- guidance document for employers and apprentices on the process/timescales for the professional discussion underpinned by a portfolio of evidence as well as a description of the purpose.
- guidance document for independent assessors on how to carry out the assessment.

Reasonable adjustments

The EPAO must have in place clear and fair arrangements for making reasonable adjustments to the assessment methods for the EPA for this apprenticeship 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 EPA plan.

Weighting of assessment methods

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

Grading

Assessment method 1: Project report with questioning

KSBs	Pass All of the following must be achieved to gain a pass:	Distinction In addition to the pass criteria, all of the following core criteria, plus the required number of tolerances, must be achieved to gain a distinction:
Software Development Lifecycle Knowledge K1, K2, K3, K20, K23 Skill S2, S15, S22 Behaviour B3	Explains the fundamentals of all stages of the software development life cycle in their project (K1) Identifies roles and responsibilities within the software development life cycle and contrasts them with the roles and responsibilities of the project life cycle. (K2, K3) Demonstrates the basic principles of software project planning including: Risks and dependencies, integration, prioritisation of tasks, escalation of problems, quality, time and end user experience (K20) Demonstrates the basic principles of digital tools and their use in business such as: • management and presentation tools • evaluation tools and techniques such as project management tools (K23) Applies appropriate secure development principles to specific software components at all stages of development in the project (S2) Demonstrates following simple software designs and functional/technical	Evaluates the secure development principles used within the project by reference to specific software components throughout the stages of development (S2) Evaluates the principles followed, and the tools used in the project planning and development stages and how the tools support organisational performance. (K20, K23)

	specifications in line with work instructions (S15) Demonstrates how Key Performance Indicators (KPIs) can be used to frame and measure desired outcomes. (S22) Demonstrates how they work independently and to take responsibility within tightly defined parameters (B3)	
Software Testing Knowledge K13 Skill S5, S7, S16, S26,	Explains the key principles of software testing frameworks and methodologies (K13) Explains how they test simple code and analyse results to correct errors found using unit testing under supervision (S5) Explains how they apply structured techniques to problem solving, including carry out simple debug of code (S7) Explains how they have followed simple testing frameworks and methodologies in line with work instructions (S16) Describes simple debugging techniques, such as interactive debugging, print debugging, remote debugging. (S26)	Critically analyses testing frameworks and methodologies (K13, S7)
Development Knowledge K7, K10, K12, K14, K15, K19	Explains the fundamentals of software design approaches and patterns, including when to identify reusable solutions to commonly occurring problems in the project (K7)	

Skill S1, S11, S14, S19	Describes the fundamental principles of algorithms, logic and data structures. (K10) Identifies basic principles of software designs and functional/technical specifications within the project (K12) Describes the principles of pattern recognition such as looking for similarities among and within problems (K14) Demonstrates the fundamentals of breaking down a complex problem or system into smaller, more manageable parts (K15) Utilises fundamental approaches to actions such as sequence, selection and iteration (K19) Writes simple code for discrete software components following an appropriate logical approach to agreed standards under supervision (S1) Explains how they have defined functional and non-functional requirements such as use cases, storyboards, user stories, performance and accessibility (S11) Explains building scripts in line with work instructions for deployment into the relevant environment (S14) Applies algorithms, logic and data structures in line with work instructions (S19)	

Software support Skill S10 Behaviour B4, B6	Describes how they support the creation of simple software documentation and visuals to effectively communicate understanding of the program (S10) Explains how they maintain a productive, professional and secure working environment (B4) Explains how they are self-motivated, for example manages own time effectively, takes responsibility to complete the job. (B6)	

A fail grade will be awarded if the apprentice does not satisfy all of the pass criteria.

Assessment method 2: Professional discussion underpinned by portfolio.

KSBs	Pass **All of the following must be achieved to gain a pass:**	Distinction **In addition to the pass criteria, all of the following core criteria, plus the required number of tolerances, must be achieved to gain a distinction:**
Systems and support Knowledge K9, K11, K17 Behaviour B2	Explains the fundamentals of computing systems including physical, virtual and cloud technologies. (K9) Explains the principles and uses of relational and non-relational (nosql) databases. (K11) Outlines the basic principles of emerging technology trends and innovations (K17) Reflects on their progress in the organisation with reference to their CPD	Analyses emerging technology trends and innovations. (K17)

	record and identifies areas for future development/participation. (B2)	
Software Testing Knowledge K22 Skill S6	Describes the principles of testing for components, interfaces, and the resulting service. (K22) Describes how they have conducted a range of test types under supervision, (S6).	
Working Legally and Securely Knowledge K8, K16, K18, K21, K24 Skill S8, S12, S20, S23, S29, S31	Describes the organisational policies and procedures relating to the tasks being undertaken, and when to follow them. (K8) Outlines the importance of valuing difference and understanding the protected characteristics named in the Equality Act 2010 (K16) Explains legal and regulatory requirements and outlines their practical application to the role of software developer. (K18) Explains the basic principles of processes and protocols used to ensure internet security (K21) Explains the role and importance of Industry Standards and where to find them (e.g. ISO standards, IETF RFCs). (K24) Explains how they follow organisational and industry good coding practices (including for naming, commenting etc.) (S8) Explains how they work within operational requirements such as health and safety, budgets, brands and normal business protocols (S12)	Evaluates their contribution to ensuring software design solutions include secure principles (K21, S20, S23, S29) Critically evaluates the importance of coding standards (organisational or industry) in a team environment as well as working individually with reference to their projects. (S8)

	Justifies their interpretation and implementation of work instructions to contribute to building a given design whist remaining compliant with security and maintainability requirements (S20) Explains how they have implemented secure code in languages of different types which is maintainable, readable and functional. (S23) Outlines how they apply and maintain procedures and security controls to ensure confidentiality, integrity and availability. (S29) Explains how they follow instructions to ensure client data is held securely under supervision (S31)	
Development Knowledge K5, K25, Skill S3, S4, S9, S13, S17, S21, S24, S25, S27, S28, S30, S32 Behaviour B1	Outlines the key similarities and differences between different software development methodologies (K5) Compares and contrasts different software development approaches for example object oriented, event driven or procedural. (K25) Describes how they have supported the development of effective user interfaces. (S3) Makes simple connections between code and defined data sources as specified (S4) Explains how they solve logical problems, seeking assistance when required (S9)	Evaluates the different software development methodologies and justifies the choice of methodology used with reference to their projects and the organisation. (K5) Analyses different approaches to user interface development with reference to their organisations functional/technical standards and software type, justifying their choice for the project'. (S13) Analyses techniques to break down complex problems identifying how approaches to their application vary dependent on the software context (S22) Evaluates their contribution to building a given software design solution and their approach to

	Demonstrate how they have developed user interfaces as appropriate to the organisation's development standards and the type of software development being developed (S13) Explains how they follow company, team or client approaches to continuous integration, version and source control as instructed (S17) Discusses how they apply techniques to break down complex problems (S21) Explains how they design simple software solutions to meet a requirement justifying their choice of tools and techniques (S24) Describes how they work in a shared code base using selected tools and following the defined etiquette and tools (S25) Explains how they implement test plans under supervision to show that it is implementable in practice and conforms to the plan. (S27) Explains how they develop and use simple acceptance criteria. (S28) Outlines how they use collaboration tools and technologies for source and version control to enable working together on common projects, regardless of physical location and for writing technical documentation for, and adapting to, specific audience(s). (S30, S32)	working collaboratively (K6, S17, S25, S30)

	Reflects on their use of critical thinking skills when undertaking work tasks (B1)	
Communication and collaboration Knowledge K4, K6 Skill S18 Behaviour B5	Describes different communication methods, how to adapt in response to different audiences including collaborative technologies such as discussion threads and document collaboration. (K4) Outlines the principles of effective teamwork to produce software (K6) Describes how they support the communication of software solutions and ideas to technical and non-technical stakeholders. (S18) Describes how they are a team player, for example working collaboratively, keeping others informed using effective communication, recognising personal and professional limitations and seeking advice when necessary. (B5)	

Overall EPA grading

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

Performance in the EPA will determine the apprenticeship grade of fail, pass, merit or distinction.

Independent assessors must individually grade the project with questioning and the professional discussion underpinned by a portfolio of evidence, according to the requirements set out in this EPA plan.

EPAOs must combine the individual assessment method grades to determine the overall EPA grade.

Apprentices who fail one or more assessment method will be awarded an overall EPA 'fail.'

In order to gain an overall EPA 'pass', apprentices must achieve a pass in both assessment methods.

In order to gain an overall EPA 'merit', apprentices must achieve a pass in one assessment method and a distinction in the other assessment method.

In order to achieve an overall EPA distinction, apprentices must achieve a distinction in both assessment methods.

Grades from individual assessment methods should be combined in the following way to determine the grade of the EPA as a whole:

Assessment method 1 Project report with questioning	Assessment method 2 Professional discussion underpinned by portfolio	Overall grading
Fail	Any grade	Fail
Any grade	Fail	Fail
Pass	Pass	Pass
Pass	Distinction	Merit
Distinction	Pass	Merit
Distinction	Distinction	Distinction

Any grade = fail, pass or distinction

Re-sits and re-takes

Apprentices who fail one or more assessment method/s will be offered the opportunity to take a re-sit or a re-take at the employer's discretion. The apprentice's employer will need to agree that either a re-sit or re-take is an appropriate course of action.
A re-sit does not require further learning, whereas a re-take does.
Apprentices should have a supportive action plan to prepare for a re-sit or a re-take.

If the apprentice fails the project assessment method, they will be required to amend the project in line with the independent assessor's feedback. The apprentice will be given 3 weeks to rework and submit the amended project. The independent assessor will have 2 weeks to review the project.

The timescale for a re-sit/re-take is agreed between the employer and EPAO. A re-sit is typically taken within 2 months of the EPA outcome notification. The timescale for a re-take is dependent on how much re-training is required and is typically taken within 3 months of the EPA outcome notification.

All assessment methods must be taken within a 3-month period, otherwise the entire EPA will need to be re-sat/re-taken.

Re-sits and re-takes are not offered to apprentices wishing to move from pass to a higher grade. Where any assessment method has to be re-sat or re-taken, the apprentice will be awarded a maximum EPA grade of distinction.

Roles and responsibilities

Role	Responsibility
Apprentice	As a minimum, apprentices should: • participate in and complete on-programme training to meet the KSBs as outlined in the occupational standard for a minimum of 12 months. • undertake 20% off-the-job training as arranged by the employer and training provider. • understand the purpose and importance of EPA. • undertake the EPA including meeting all gateway requirements
Employer	As a minimum, employers should: • select the EPAO and training provider. • work with the training provider (where applicable) to support the apprentice in the workplace to provide the opportunities for the apprentice to develop the KSBs. • arrange and support a minimum of 20% off-the-job training to be undertaken by the apprentice. • decide when the apprentice is working at or above the occupational standard and so is ready for EPA. • ensure that all supporting evidence required at the gateway is submitted in accordance with this EPA plan. • remain independent from the delivery of the EPA. • confirm arrangements with the EPAO for the EPA (who, when, where) in a timely manner (including providing access to any employer specific documentations as required, for example company policies) • ensure that the EPA is scheduled with the EPAO for a date and time which allow appropriate opportunity for the KSBs to be met. • ensure the apprentice is well prepared for the EPA. • ensure the apprentice is given sufficient time away from regular duties to prepare for and complete all post-gateway elements of the EPA, and that any required supervision during this time (as stated within this EPA plan) is in place. • where the apprentice is assessed in the workplace, ensure that the apprentice has access to the resources used on a daily basis.
EPAO	As a minimum, EPAOs should: • make all necessary contractual arrangements, including agreeing the price of the EPA. • understand the occupational standard.

	• appoint administrators (and invigilators where required) to administer the EPA as appropriate. • provide training for independent assessors in terms of good assessment practice, operating the assessment tools and grading. • provide adequate information, advice and guidance documentation to enable apprentices, employers and training providers to prepare for the EPA. • arrange for the EPA to take place, in consultation with the employer. • conform to the requirements of this EPA plan and deliver its requirements in a timely manner. • develop and provide appropriate assessment recording documentation to ensure a clear and auditable process is in place for providing assessment decisions and feedback to all relevant stakeholders. • have no direct connection with the apprentice, their employer or training provider. In all instances including when the EPAO is the training provider (i.e. HEI) there must be no conflict of interest • have policies and procedures for internal quality assurance (IQA) and maintain records of regular and robust IQA activity and moderation for external quality assurance (EQA) purposes. • conform to the requirements of the nominated external quality assurance provider (EQAP) • conform to the requirements of the Register of End-Point Assessment Organisations (RoEPAO) • deliver induction training for independent assessors, and for invigilators and markers where used. • undertake standardisation activity on this apprenticeship standard for all independent assessors before they conduct an EPA for the first time, if the EPA is updated and periodically as appropriate (a minimum of annually) • manage invigilation of apprentices in order to maintain security of the assessment in line with their malpractice policy. • verify the identity of the apprentice being assessed. • use language in the development and delivery of the EPA that is appropriate to the level of the occupational standard. • request certification via the Apprenticeship Service upon successful achievement of the EPA • develop and produce assessment materials including specifications and marking materials (for example mark schemes, practice materials, training material) • appoint suitably qualified and competent independent assessors. • provide details of the independent assessor's name and contact details to the employer.

	• have and apply appropriately an EPA appeals process
Independent assessor	As a minimum, an independent assessor should: • have the competence to assess the apprentice at this level and hold any required qualifications and experience in line with the requirements of the independent assessor as detailed in the IQA section of this EPA plan. • understand the occupational standard and the requirements of this EPA plan. • have, maintain and be able to evidence up to date knowledge and expertise of the subject matter. • deliver the end-point assessment in-line with the EPA plan. • comply with the IQA requirements of the EPAO. • have no direct connection or conflict of interest with the apprentice, their employer or training provider; in all instances including when the EPAO is the training provider (i.e. HEI) • attend induction training. • attend standardisation events when they begin working for the EPAO, before they conduct an EPA for the first time and a minimum of annually on this apprenticeship standard. • assess each assessment method, as determined by the EPA plan, and without extending the EPA unnecessarily. • assess against the KSBs assigned to each assessment method, as shown in the mapping of assessment methods and as determined by the EPAO, and without extending the EPA unnecessarily. • make all grading decisions. • record and report all assessment outcome decisions, for each apprentice, following instructions and using assessment recording documentation provided by the EPAO, in a timely manner. • use language in the development and delivery of the EPA that is appropriate to the level of the occupational standard
Training provider	As a minimum, the training provider should: • work with the employer and support the apprentice during the off-the-job training to provide the opportunities to develop the knowledge, skills and behaviours as listed in the occupational standard. • conduct training covering any knowledge, skill or behaviour requirement agreed as part of the Commitment Statement (often known as the Individual Learning Plan). • monitor the apprentice's progress during any training provider led on-programme learning. • advise the employer, upon request, on the apprentice's readiness for EPA

	• remain independent from delivery of the EPA. Where the training provider is the EPA (i.e. a HEI) there must be procedures in place to mitigate against any conflict of interest

Internal Quality Assurance (IQA)

Internal quality assurance refers to the strategies, policies and procedures that EPAOs organisations must have in place to ensure valid, consistent and reliable end-point assessment decisions. EPAOs for this EPA must adhere to all requirements within the Roles and Responsibilities section and:

- have effective and rigorous quality assurance systems and procedures that ensure fair, reliable and consistent assessment across employers, places, times and independent assessors
- appoint independent assessors who have recent relevant experience of the occupation/sector gained in the last three years or significant experience of the occupation/sector and evidence of continued professional development
- appoint independent assessors who are competent to deliver the end-point assessment
- operate induction training for independent assessors, markers and invigilators
- provide training for independent assessors in terms of good assessment practice, operating the assessment tools and grading.
- where appropriate:
    - provide ongoing training for markers.
    - provide ongoing training for invigilators.
- undertake standardisation activity on this apprenticeship standard for all independent assessors:
    - before they conduct an EPA for the first time
    - if the EPA is updated
    - periodically as appropriate (a minimum of annually)
- conduct effective moderation of assessment decisions and grades.
- conduct appeals where required, according to the EPAO's appeals procedure, reviewing and making final decisions on assessment decisions and grades.

Value for Money

Value for money of the EPA will be aided by using at least some of the following practices:

- using employers' facilities for the professional discussion
- using video conferencing for the professional discussion and questioning on the project
- the possibility of scheduling more than one assessment method on the same day, for example professional discussion and project questioning

Professional body recognition

Professional body recognition is not relevant to this apprenticeship.

Mapping of knowledge, skills and behaviours (KSBs)

Assessment method 1: Project report with questioning

Knowledge
K1: fundamentals of all stages of the software development life cycle including development, Quality Assurance, User Acceptance Testing and release
K2: roles and responsibilities within the software development life cycle
K3: roles and responsibilities of the project life cycle
K7: fundamentals of software design approaches and patterns, including when to identify reusable solutions to commonly occurring problems
K10: fundamental principles of algorithms, logic and data structures. For example, how they work using a step-by-step solution to a problem, or rules to follow to solve the problem
K12: basic principles of software designs and functional/technical specifications
K13: key principles of software testing frameworks and methodologies
K14: principles of pattern recognition such as looking for similarities among and within problems
K15: fundamentals of breaking down a complex problem or system into smaller, more manageable parts
K19: fundamental approaches to actions such as sequence, selection and iteration
K20: the basic principles of software project planning including: * risks and dependencies. * integration * prioritisation of tasks * escalation of problems * quality * time * end user experience
K23: Basic principles of Digital tools and their use in business: • management and presentation tools • evaluation tools and techniques such as project management tools
Skills
S1 write simple code for discrete software components following an appropriate logical approach to agreed standards (whether web, mobile or desktop applications) under supervision

S2 apply appropriate secure development principles to specific software components at all stages of development
S5 test simple code and analyse results to correct errors found using unit testing under supervision
S7 apply structured techniques to problem solving, including carry out simple debug of code
S10 support the creation of simple software documentation and visuals to effectively communicate understanding of the program
S11 define functional and non-functional requirements such as use cases, storyboards, user stories, performance and accessibility.
S14 build scripts in line with work instructions for deployment into the relevant environment
S15 follow simple software designs and functional/technical specifications in line with work instructions
S16 follow simple testing frameworks and methodologies in line with work instructions
S19 apply algorithms, logic and data structures in line with work instructions
S22 Demonstrate how Key Performance Indicators (KPIs) can be used to frame and measure desired outcomes.
S26 Use simple debugging techniques, such as interactive debugging, print debugging, remote debugging
Behaviour
B3: work independently and take responsibility within tightly defined parameters
B4: Maintain a productive, professional and secure working environment
B6: Self-motivated, for example manages own time effectively, takes responsibility to complete the job.

Assessment method 2: Professional discussion underpinned by portfolio.

Knowledge
K4: different communication methods, how to adapt appropriately to different audiences and including collaborative technologies such as discussion threads and document collaboration.
K5: the key similarities and differences between different software development methodologies, such as agile and waterfall.
K6: principles of effective teamwork to produce software
K8: organisational policies and procedures relating to the tasks being undertaken, and when to follow them. For example, the storage and treatment of General Data Protection Regulation (GDPR) sensitive data.
K9: Fundamentals of computing systems including physical, virtual and cloud technologies

K11: principles and uses of relational and non-relational (NoSQL) databases
K16: the importance of valuing difference and understanding the protected characteristics named in the Equality Act 2010
K17: basic principles of emerging technology trends and innovations such as Internet of Things (IoT) Artificial Intelligence (AI) Augmented Reality (AR)
K18: awareness of legal and regulatory requirements and their practical application to the role for example, Data Protection, Security, Intellectual Property Rights (IPR), Data sharing, marketing consent, personal data definition.
K21: basic principles of processes and protocols used to ensure internet security, including concepts of security assurance.
K22: key principles of testing for all components (including software, hardware, data), interfaces and the resulting service.
K24: role and importance of Industry Standards and where to find them (e.g., ISO standards, IETF RFCs).
K25: software development approaches for example object oriented, event driven or procedural
Skills
S3 support development of effective user interfaces
S4 make simple connections between code and defined data sources as specified
S6 conduct a range of test types under supervision, such as Functional and Non-Functional.
S8 follows organisational and industry good coding practices (including for naming, commenting etc.)
S9 solve logical problems, seeking assistance when required (including appropriate mathematical application)
S12 work within operational requirements such as health and safety, budgets, brands and normal business protocols
S17 follow company, team or client approaches to continuous integration, version and source control as instructed
S18 support the communication of software solutions and ideas to technical and non-technical stakeholders
S20 follow work instructions to contribute to building a given design whist remaining compliant with security and maintainability requirements
S21 apply techniques to break down complex problems.
S23 implement secure code in appropriate languages of different types which is maintainable, readable, functional.
S24 design simple software solutions to meet a requirement using tools and techniques, such as waterfall and agile
S25 work in a shared code base with appropriate etiquette and tools, such as modularity and data definition

S27 implement test plans under supervision to show that a test plan is implementable in practice and implementation conforms to the plan.
S28 develop and use simple acceptance criteria.
S29 apply and maintain procedures and security controls to ensure confidentiality, integrity and availability.
S30 use collaboration tools and technologies for source and version control to enable working together on common projects, regardless of physical location.
S31 follow instructions to ensure client data is held securely under supervision e.g. not using personally identifiable information in test systems, making sure personal actions comply with ICO regulations
S32 Use collaboration tools and technologies for writing technical documentation for, and adapting to, specific audience(s). e.g. technical, non-technical, internal, external
Behaviours
B1: use critical thinking skills when undertaking work tasks
B2: committed to guided Continuous Professional Development
B5: team player, for example working collaboratively, keeping others informed using effective communication, recognising personal and professional limitations and seeking advice when necessary.