Data Engineer Apprenticeship Level 5

BCS End-Point Assessment Guide v1.0

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The Chartered Institute for IT

Contents

Introduction

In today's data-driven landscape, organisations rely heavily on data infrastructure and insights to make informed decisions. Data engineers play a pivotal role in this process, ensuring that data pipelines are robust, efficient and scalable; they are responsible for building systems that collect, manage, and convert data into usable information. The resulting accessible and valid data can then be utilised by data analysts and other stakeholders to derive meaningful insights, evaluate, and optimise organisational performance.

Full details of the Level 5 Data Engineer apprenticeship and what is required for successful completion can be found in the IfATE **Standard** and **EPA Plan**. BCS encourages you to read these documents and be familiar with their content. This document is not intended to replace the EPA Plan but to complement it.

The purpose of this document is to:

- Highlight the key information needed to understand the standard.
- Provide guidance on the times and processes for the end-point assessment (EPA).
- Share best practice tips for successful completion of the EPA.
- Provide supporting documentation and forms specific to this EPA.

The BCS website provides the broad view on how to run an apprenticeship programme to the BCS Digital Industries Standard. This document has been designed to give training providers the tools to build their programme and to assist them in helping apprentices and employers towards the successful completion of each element of the EPA.

Change History

Changes made to this document are recorded below. This includes the latest version number, date of the amendment, and details of the change. The purpose is to identify the updates undertaken.

Version number and date	Date	Changes made
V1.0	February 2024	Document created.

Roles and Responsibilities

The five main roles involved in a successful EPA are the:

- Apprentice
- Employer
- Training provider (including further education providers)
- BCS - your end-point assessment organisation (EPAO)
- Independent assessor

Each party has a responsibility to ensure the apprentice achieves the best possible outcome. Some of the **minimum** responsibilities are listed below. For full details, please refer to the **EPA Plan.**

Role	Minimum Responsibility
Apprentice	- Complete on-programme training to meet the KSBs as outlined in the apprenticeship standard for a minimum of 12 months. - Complete the required amount of off-the-job training specified by the apprenticeship funding rules and as arranged by the employer and training provider. - Understand the purpose and importance of EPA. - Prepare for and undertake the EPA including meeting all gateway requirements.
Employer	- Work with the training provider (where applicable) to support the apprentice in the workplace and to provide the opportunities for the apprentice to develop the KSBs. - Arrange and support off-the-job training to be undertaken by the apprentice. - Decide when the apprentice is working at or above the occupational standard and is ready for EPA. - 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 the EPA. - Ensure the apprentice has access to the resources used to fulfil their role and carry out the EPA for workplace based assessments.
Training Provider	- Work with the employer and support the apprentice during the off-the-job training to provide the opportunities to develop the KSBs as outlined in the occupational standard. - 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.

Roles and Responsibilities

Role	Minimum Responsibility
BCS	• Conform to the requirements of the EPA plan and deliver its requirements in a timely manner. • Provide 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 a timely manner, in consultation with the employer. • Provide information, advice, and guidance documentation to enable apprentices, employers and training providers to prepare for the EPA. • Confirm the gateway requirements have been met before they start the EPA for an apprentice. • Maintain the security of the EPA including, but not limited to, verifying the identity of the apprentice, invigilation and security of materials.
Independent Assessor	• Be independent, with no conflict of interest with the apprentice, their employer or training provider, specifically, they must not receive a personal benefit or detriment from the result of the assessment. • Have, maintain and be able to evidence up-to-date knowledge and expertise of the occupation. • Have the competence to assess the EPA and meet the requirements of the IQA section of the EPA plan. • Understand the apprenticeship's occupational standard and EPA plan. • Attend induction and standardisation events before they conduct an EPA for the first time, when the EPA is updated, and at least once a year. • Conduct the EPA to assess the apprentice against the KSBs and in line with the EPA plan. • Make final grading decisions in line with this EPA plan. • Record and report assessment outcome decisions. • Comply with the IQA requirements of the EPAO. • Comply with external quality assurance (EQA) requirements.

The Apprenticeship Journey

Registration

The apprentice is registered by the training provider on ACE 360 near the start of the apprenticeship.

On-Programme Training

Workplace competence is developed, supported by the employer and training provider, in line with the apprenticeship standard.

Gateway Reached

Employer is satisfied that the apprentice is consistently working at the level set out in the apprenticeship standard.

Gateway

Gateway evidence as required by the apprenticeship standard is uploaded onto ACE 360 by the training provider.

End-Point Assessment

Apprentice undertakes the required assessment methods for the apprenticeship standard, assessed by BCS.

Certification

Grade and feedback upoloaded to ACE360 by BCS. Certificate issued by ESFA.

The Apprenticeship Journey

Employer provides the apprentice with on-the-job training and workplace development opportunities, a mentor, and support to undertake the apprenticeship and prepare for end-point assessment.

Training Provider provides training, skills coaching, on-programme assessment, and support for gateway preparation, and support for end-point assessment.

BCS (the EPAO) provides guidance and support for the end-point assessment to the apprentice, employer and training provider, and undertakes the assessment of the apprentice.

Full-time apprentices will require a minimum of 20% off-the-job training.

BCS provides a timeline of the journey through gateway to completion of the EPA, including what is required and when from the apprentice, training provider and employer, and what to expect from BCS in return. This can be found in the End-to-End Guide document.

The Data Engineer Apprenticeship

The role of a data engineer is fundamental in enabling organisations to leverage data effectively. Data engineers are responsible for designing, constructing and maintaining the systems and infrastructure that enable the collection, storage and processing of data at scale. Their primary objective is to ensure that data is accessible, reliable and ready for analysis by data scientists, analysts and other stakeholders.

The role involves:

- Building and optimising automated data systems and pipelines considering data quality, description, cataloguing, data cleaning, validation, technical documentation and requirements.
- Integrating, supporting and managing data using standalone, distributed and cloud-based platforms.
- Supporting the identification and evaluation of opportunities for data acquisition and data enrichment.
- Ensuring resilience is built into data products.
- Analysing requirements, research scope and options and presenting recommendations for solutions to stakeholders.
- Maintaining data solutions as continually evolving products, to service the organisation, user or client requirements.
- Contributing towards data governance, organisational policies, standards, and guidelines for data engineering.
- Monitoring the data system to meet service requirements to enable solutions.

Typical job titles: data engineer.

Key Information

- Maximum funding: £19,000
- Typical timescales:
    » On programme: 24 months (12 months minimum)
    » End-point assessment (EPA): 4 months
- Gateway requirements:
    » Employer declaration
    » Project brief for the project evaluation report, presentation and questions.
      Please note, the EPAO should sign-off the project's title and scope at the gateway to confirm it is suitable
    » Gateway declaration
    » Any **reasonable adjustments**
    » English and mathematics at level 2 to be achieved prior to EPA

Entry Requirements

There are no specific entry requirements for this standard, however candidates must meet the gateway requirements before starting their EPA.

Specialisms

The Data Engineer apprenticeship is a core-only standard. No specialisms apply.

Off-the-Job Training

While on programme, the apprentice will develop new knowledge, skills and behaviours through off-the-job training. This must take place during working hours, with the intention to upskill, in order to reach full occupational competency. A minimum of 20% of the apprentice's working time should be spent on off-the-job training while on programme. This can include (but is not limited to) activities such as the attendance of lectures, online learning, work shadowing, mentoring, industry visits, or time spent undertaking assessments or assignments. Off-the-job training underpins the development of KSBs that are further developed in the workplace. As such, it is not directly assessed during the end-point assessment.

Work Activities

BCS has mapped this apprenticeship to **SFIA*plus* v8.0**, the internationally recognised Skills Framework for the Information Age, and to suggested work activities outlined in **SFIAplus** (developed by BCS). These work activities describe the types of tasks the apprentice is likely to be involved in, based on the type of role they are undertaking and their level of responsibility. As the apprenticeship standards are designed to cover a wide range of different job roles, it is important to note that the activities listed here are suggested and there may be alternative work activities within the apprentice's job role that also demonstrate their competence.

The **SFIAplus** codes for each work activity are included on the following page. Please note, the list below is not exhaustive. More information on **SFIAplus** can be found on the **BCS website**.

RITTech - The registration for IT technicians

RITTech is a professional registration for IT technicians working in the digital space. Upon successful completion of the end-point assessment, apprentices will be entitled to obtain RITTech registration. By doing so, and using the post-nominals after their name, they will be part of a network of IT professionals, who can prove they have a recognised level of professional competence and are committed to ongoing continuous professional development.

Validate your technical skills, benchmark yourself against the industry and begin your journey towards chartered status.

RIT Tech

Suggested Work Activities

DENG5WA0709	Methods, tools and techniques	Plans and implements the selection and development of data engineering methods, tools and techniques.
DENG5WA0794	Data pipelines and stores	Plans and drives data engineering solution development ensuring that solutions balance functional and non-functional requirements.
DENG5WA0927	Data extraction and manipulation	Oversees the design, implementation and maintenance of all data engineering solutions developed to acquire and prepare data for analytics, data mining, machine learning, sharing etc. Ensures data quality and integrity standards are applied throughout.
DENG5WA0928	Standards, policy and legislation	Contributes to organisational policies, standards, and guidelines for data engineering. Monitors application of data policies, legislation and standards including security and compliance.
DBDS5WA0231	Requirements analysis	Works with clients/users and development groups to identify most appropriate and effective use of database management facilities. Sets strategy and standards for database environment to meet all application areas.
DTAN5WA0271	Data requirements documentation	Manages the investigation of corporate data requirements, documenting them according to the required standards utilising the prescribed methods and tools.
DBDS5WA0229	Database design	Develops complex appropriate physical database or data warehouse design elements, within set policies, to meet business change or development project data requirements. Translates object and data models into appropriate data schemas and linked data schemas within design constraints.

Gateway

Gateway is the point at the end of the apprenticeship programme (a minimum of 12 months) when the apprentice, employer and training provider all agree that the apprentice is ready to start their EPA period.

The gateway ensures that:
- All apprentices have completed the mandatory aspects of the occupational standard.
- All on-programme training and any work that underpins specified assessment methods is complete.
- Employers believe an apprentice is occupationally competent to start their EPA.

Though they may take advice from the training provider, it is solely the employer who will need to be satisfied that the apprentice is consistently working at or above the level set out in the occupational standard, and that the apprentice is therefore occupationally competent.

Full details of the gateway requirements can be found in the **EPA Plan.**

> ⓘ BCS requires you to complete the **Gateway Form** which can be found on the BCS Apprenticeship Sharepoint site, to enter gateway.
>
> The form can be used to help the employer and training provider decide if the apprentice is fully competent and ready to enter gateway.

The End-Point Assessment

The EPA window for the Data Engineer apprenticeship is four months but may be extended to a maximum of six months from the EPA outcome notification. All assessments must be successfully completed within this wider window.

Assessment Methods

There are **two** assessment methods for this standard. Detailed requirements of each assessment method can be found in the **EPA Plan**, along with the KSBs and grading descriptors that apply to each assessment method.

> ⓘ All assessment methods are post-gateway and carried out remotely. There is an EPA window, so it is essential that the apprentice is ready to complete all assessments as soon as they go through the gateway.

Assessment Method 1

Assessment method 1 is a project evaluation report, presentation and questions that's made up of two components as detailed below.

Component 1: Project with a project output
The project must meet the needs of the employer's business and be relevant to the apprentice's occupation and apprenticeship. It should provide the opportunity to demonstrate the criteria mapped to this assessment method.

The project itself is undertaken and completed on programme and pre-gateway to the EPA and is not graded. The subsequent project evaluation report is started after the gateway and assessed by BCS.

The project must be based on any of the following:

- A specific problem
- A recurring issue
- An idea or opportunity

BCS will sign-off the project's title and scope at the gateway to confirm it is suitable. The project output must be in the form of an evaluation report and presentation.

The report must include at least:

- An executive summary (or abstract)
- An introduction
- The scope of the project (including key performance indicators, aims and objectives)
- A project plan
- Research outcomes
- Data product outcomes
- Project outcomes
- Discussion of findings
- Recommendations and conclusions
- References
- Appendix mapping how the apprentice has met the KSBs

The project report must have a word count of 3500 words (+/- 10%). Appendices, references and diagrams are not included in this total. **The report, presentation and any presentation materials must be completed and submitted to BCS by the end of week 10 of the EPA period.**

On programme	**At gateway**	**Post-gateway**	**End of week 10**
The apprentice completes the project.	BCS sign off the project title and scope.	The apprentice completes the project output and presentation.	The apprentice submits the report and presentation materials to BCS.
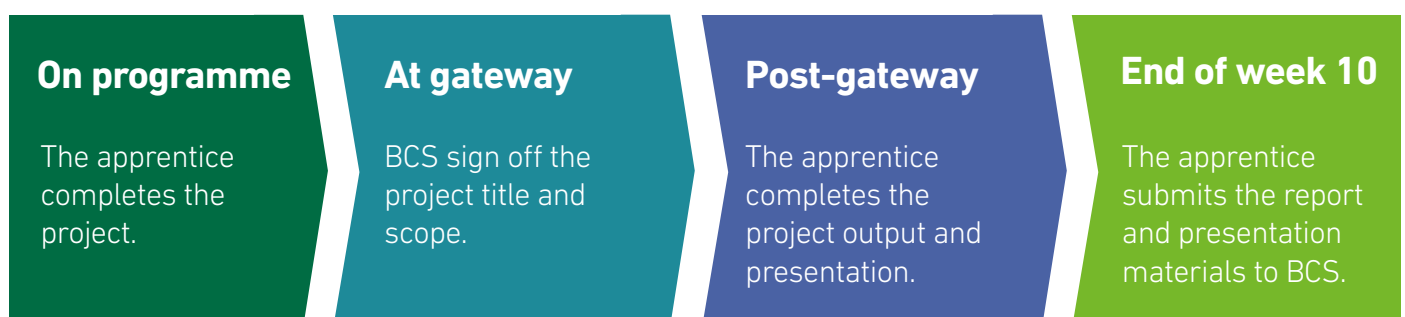
Graded: Fail, Pass or Distinction

> ⓘ Please note, the apprentice must produce and include a mapping in an appendix, showing how the report evidences the KSBs mapped to this assessment method.

Component 2: Presentation with questions

Apprentices will prepare and deliver a presentation that is based on the project. The presentation will be followed by questioning from the independent assessor. The project, presentation and questioning are assessed holistically, and apprentices will be given at least 2 weeks' notice of component 2.

When submitting the report, presentation and any presentation materials to BCS, apprentices must notify the EPAO of any technical requirements for the presentation.

The presentation to the independent assessor will be delivered on a one-to-one basis and it should cover:

- An overview of the project
- The project scope (including key performance indicators)
- Summary of actions undertaken by the apprentice
- Project outcomes and how these were achieved

The independent assessor will ask at least six questions after the presentation to seek clarification , verify the apprentice's work and assess competence.

The presentation with questions will last 50 minutes, including a 20-minute presentation and 30-minute questioning. The assessor can increase the time of the presentation and questioning by up to 10%. This time is to allow the apprentice to complete their last point or respond to a question if necessary.

Assessment Method 2

Assessment method 2 is a professional discussion.

In the professional discussion, the independent assessor and the apprentice have a formal two-way conversation which gives the apprentice the opportunity to demonstrate their competency across the criteria.

BCS will give the apprentice 2 weeks' notice of the professional discussion.

During the assessment, the assessor will ask 10 questions, two for each of the themes:

- Data quality and performance
- Problem solving
- Regulatory Compliance
- Continuous Improvement
- Continuous professional development

Follow-up questions are allowed where clarification is required. The professional discussion will last for 80 minutes (+10% at the assessor's discretion to allow the apprentice to respond to a question if necessary).

This assessment method is graded as fail, pass or distinction.

ⓘ Both the presentation with questioning and the professional discussion will be conducted by video conferencing. Apprentices must arrange for a suitably controlled environment that is a quiet room, free from distractions and influence (for example, the employer's premises).

BCS will verify the identity of the apprentice and ensure that the apprentice is not being aided.

Additional Guidance

There is a range of resources available for apprentices to explore what's involved in each assessment method and how you can best prepare for success. These are available in the apprenticeship section within **MyBCS**.

Apprentices who have not been registered for BCS membership, can **create an account for free**, which will then give them access to MyBCS.
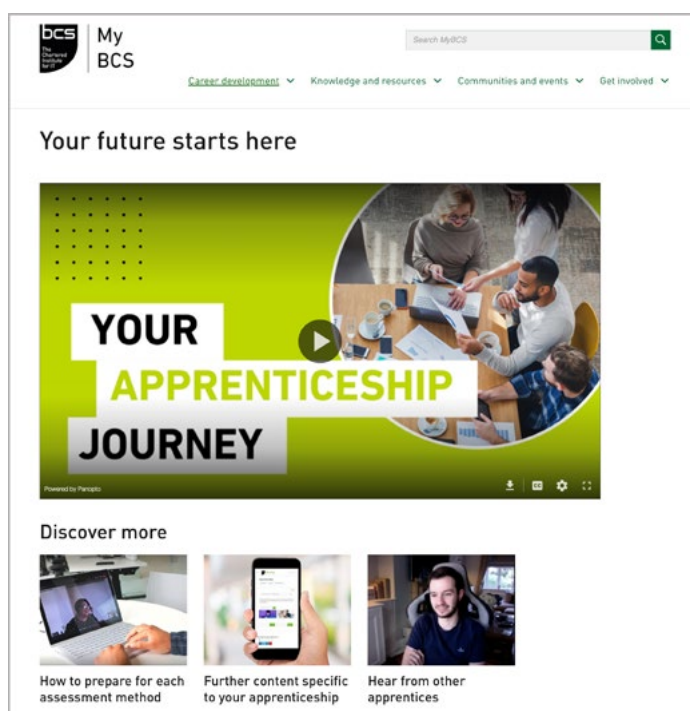
Grading

Full details of the grading requirements can be found within the grading section of the **EPA Plan.** Below is a summary of how the overall apprenticeship is graded.

Project evaluation report, presentation and questions	Professional discussion	Overall grading
Fail	Fail	Fail
Fail	Pass	Fail
Pass	Fail	Fail
Pass	Pass	Pass
Pass	Distinction	Merit
Distinction	Pass	Merit
Distinction	Distinction	Distinction

Next Steps

Re-sits and Re-takes

While we hope that all our apprentices will be successful in their assessments on their first attempt, there will be occasions in which a re-sit or re-take is required.

> (i) A re-sit is when an apprentice can take the assessment method again without requiring additional training. A re-take indicates that further training is needed.

If a re-sit or re-take is needed, the timescale for these is agreed between the employer and EPAO. A re-sit is typically taken within three 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 six months of the EPA outcome notification.

If the apprentice fails the project assessment method, they must amend the project output in line with the independent assessor's feedback. The apprentice will be given 4 weeks to rework and submit the amended report.

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

The apprentice will get a maximum EPA grade of pass for a re-sit or re-take, unless the EPAO determines that there are exceptional circumstances.

Full details can be found in the **EPA Plan.**

Certification

On the apprentice's successful completion of the EPA, the ACE360 system automatically requests the certificate with the ESFA. The delivery address is taken from the employer details on the apprentices' record. It is very important this information is correct so that the certificate can be delivered to the correct address.

Distinction certificates are requested five working days after the grade is awarded. Merit and pass grades are requested 20 working days after the grade is awarded. This period allows for the apprentice to appeal the final grade if necessary.

Please refer to the **Appeals Policy** online for guidance.

Please allow 15 working days for the certificate to arrive from the ESFA after the BCS request has been sent.

For changes or special requests please refer to the **BCS Operations Manual.**

Beyond EPA

In recognition of their achievement, BCS is offering all apprentices who successfully complete a BCS-accredited EPA, one year's RITTech registration along with BCS professional membership (MBCS) at a significantly discounted rate. To find out more and to get started, all successful apprentices should follow this link in the 30 days from completing their EPA interview: **bcs.org/beyondepa**

CONTACT

BCS wants every apprentice to have the best possible experience in their end-point assessment. If you require further support to achieve this, please contact us:

Your BCS Key Account Manager in the first instance.
epateam@bcs.uk for scheduling queries
epa.quality@bcs.uk for queries relating to results

If you have any queries relating to the online assessments, please contact;
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