Qualification Specification for the Knowledge Modules that Form Part of the BCS Level 4 Data Analyst Apprenticeship

BCS Level 4 Certificate in Data Analysis Tools

BCS Level 4 Diploma in Data Analysis Concepts

Version 1.0

December 2016

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1. About BCS

Our mission as BCS, The Chartered Institute for IT, is to enable the information society. We promote wider social and economic progress through the advancement of information technology, science and practice. We bring together industry, academics, practitioners and government to share knowledge, promote new thinking, design new curricula, shape public policy and inform the public.

Our vision is to be a world class organisation for IT. Our 70,000 strong membership includes practitioners, businesses, academics and students in the UK and internationally. We deliver a range of professional development tools for practitioners and employees. As a leading IT qualification body, we offer a range of widely recognised qualifications.

2. Equal Opportunities

BCS wishes to ensure good practice in the area of Equal Opportunity. Equality of opportunity extends to all aspects for the provision of BCS qualifications.

3. Introduction to the Qualification

3.1 Qualification summary

Qualification Title	QAN	Accreditation Start
1. BCS Level 4 Certificate in Data Analysis Tools	603/0824/2	9/12/16
2. BCS Level 4 Diploma in Data Analysis Concepts	603/0823/0	9/12/16

The two knowledge module qualifications listed above are required for the Level 4 Data Analyst Digital IT Apprenticeship. They have been developed based on the requirements set out in the Standard issued by Tech Partnership and approved by the Government, details of which can be located in the Assessment Plan (Click here) and Occupational Brief (Click here) documents. An apprentice needs to have passed both knowledge module qualifications before being able to move on to the End Point Assessment to complete their apprenticeship.

Please note an apprentice can be exempt from the first of the above knowledge module qualifications by passing the approved vendor or professional qualification located in the Occupation Brief instead.

All BCS qualifications are subject to our quality assurance and validation process. This ensures that new and revised qualifications are fit for purpose. Qualifications are reviewed to ensure the alignment of the qualification with agreed design principles, regulatory requirements and to ensure accuracy and consistency across units and qualifications. Through our quality assurance and validation process, we ensure the qualification, its units and assessments are fit for purpose and can be delivered efficiently and reasonably by Training Providers.

3.2   Purpose of the qualifications

The qualifications are designed for apprentices enrolled on the Level 4 Data Analyst Digital IT Apprenticeship, to provide them with the technical knowledge and understanding they require for their role detailed below:

A Data Analyst collects, organises and studies data to provide business insight. Data analysts are typically involved with managing, cleansing, abstracting and aggregating data, and conducting a range of analytical studies on that data. They work across a variety of projects, providing technical data solutions to a range of stakeholders/customers issues. They document and report the results of data analysis activities making recommendations to improve business performance. They have a good understanding of data structures, database systems and procedures and the range of analytical tools used to undertake a range of different types of analyses.

3.3   Structure of the qualifications

This document covers the following qualifications which are used towards the Level 3 Infrastructure Technician Apprenticeship. The qualifications can be taken in any order however it is recommended that they be completed in the following sequence:

1. BCS Level 4 Certificate in Data Analysis Tools
2. BCS Level 4 Diploma in Data Analysis Concepts

Qualification Level 4 Data Analyst Apprenticeship	
Knowledge descriptor (the holder…)	Apprentices will develop knowledge and understanding in all aspects of data analysis tools and concepts including; the range of data protection and legal issues; the lifecycle of data; the different types of data; the differences between structured and unstructured data; the fundamentals of data structures and designing, implementing and maintenance of database systems; the importance of the domain context for data analytics; quality issues and how to avoid/resolve them;

	the importance of clearly defining customer requirements; processes and tools used for data integration; the steps involved in routine data analysis tasks; how to use and apply industry standard tools and methods.
Skills descriptor (the holder can…)	Apprentices will develop skills and be able to demonstrate; logical and creative thinking skills; analytical and problem solving skills, ability to work independently and take responsibility; can use own initiative; a thorough and organized approach, ability to work with a range of people; ability to communicate effectively in a variety of situations; maintain productive, professional and secure working environment.

3.4 Prior learning

Individual employers will set the selection criteria for enrolment onto the Apprenticeship, but this is likely to include five GCSEs, (especially English, Mathematics and a Science or Technology subject); a relevant Level 3 Apprenticeship; other relevant qualifications and experience; or an aptitude test with a focus on IT skills.

3.5 Learner progression

This document covers the qualifications that are part of the Level 4 Data Analyst apprenticeship. The qualifications must be completed to allow the apprentice to progress onto the end-point assessment, detailed below.

The final end-point assessment is completed in the last few months of the apprenticeship. It is based on:

- A Portfolio – produced towards the end of the apprenticeship, containing evidence from real work projects which have been completed during the apprenticeship, usually towards the end and which, taken together, cover the totality of the standard and which is assessed as part of the end-point assessment
- A Project - giving the apprentice the opportunity to undertake a business-related project over a one-week period away from the day to day workplace
- An Employer Reference

A Structured Interview with an Assessor - exploring what has been produced in the portfolio and the project, as well as looking at how it has been produced An independent assessor will evaluate each element of the end-point assessment and will then decide whether to award successful apprentices with a pass, a merit or a distinction.

4. Units

4.1 Guidance on the qualifications' content

The content for each qualification has been developed based on the criteria set out in the Occupational Brief.

Qualification Title	TQT (Guided Learning + Direct Study + Assessment)
1. BCS Level 4 Certificate in Data Analysis Tools	145h (80h + 64h + 1h)
2. BCS Level 4 Diploma in Data Analysis Concepts	600h (400h + 199h + 1h)

4.2 Learning Outcomes and Assessment Criteria

Qualification Name	Learning Outcomes The learner will….	Assessment Criteria The learner can…
BCS Level 4 Certificate in Data Analysis Tools	**Processes and Tools Used for Data Integration** Describe how data integration is achieved through the manipulation of data from different sources. Understand how this data is manipulated using programming languages and how it is prepared for analysis.	Describe the purpose and outputs of data integration activities.
		Explain how data from multiple sources can be integrated to provide a unified view of the data.
		Discover how programming languages for statistical computing can be applied to data integration activities to filter and prepare data for analysis.
		Explain the nature and challenges of data volumes and types being processed through data integration activities.
		Develop appropriate testing strategies to ensure that unified data sets are correct, complete and up to date.
	Industry Standard Tools and Methods for Data Analysis Describe and use a range of tools, techniques and methods to prepare and analyse data.	Demonstrate the data manipulating, processing, cleaning and analysis capabilities of statistical programming languages and proprietary software tools.
		Demonstrate how to apply statistical programming languages in preparing data for analysis and conducting analysis projects.

Qualification Name	Learning Outcomes The learner will….	Assessment Criteria The learner can…
BCS Level 4 Diploma in Data Analysis Concepts	**Types of Data** Explore the different types of data, including open and public data, administrative data, and research data.	Describe the difference between data, information and knowledge.
		Explain the range of different types of data.
		Apply classification schemes for data.
	The Data Lifecycle Explore the data lifecycle.	Illustrate and describe that the data lifecycle management is a comprehensive approach to managing the flow of an information system's data and its associated metadata.
		Explain each of the stages of a data lifecycle.
	Structured and Unstructured Data Illustrate the differences between structured and unstructured data.	Describe that structured data is information which can be ordered and processed by data analysis tools.
		Recognise common sources of structured data.
		Explain that unstructured data can take various formats.
		Illustrate that, in order to maximise insight and derive useful business intelligence, organisations need to analyse both structured and unstructured data.
		Recognise how structured and unstructured data complement each other.
	Requirements for Data Analysis	Recognise and demonstrate that data itself does not provide the answers to business problems.

		Show the importance of clearly defining customer requirements for data.	Recognise and apply the key to effective data analysis is by asking the right questions which are defined as stakeholder requirements.
	Quality Issues for Data Analysis Develop an understanding of the quality issues that can arise with data and how to avoid and/or resolve issues experienced.	Recognise how data quality relates to: • Confidentiality • Integrity • Availability	
			Illustrate the importance of good quality data.
			Demonstrate that minor data errors can cause major issues for data analysis.
			Identify the common sources of errors.
			Demonstrate that improving data quality and defining an organisational strategy for improved source data creation and storage will directly benefit the value of data analytics to improve business decision making.
	Data Analysis Tasks Explore the steps involved in carrying out routine data analysis tasks.	Discover that data analysis is typically cyclic and iterative and illustrate the typical activities.	
	Compliance and Audit Considerations Explore and gain knowledge on the range of data protection and legal issues.	Describe the data protection and privacy issues that can occur during data analysis activities.	
			Explain the need to comply with the Data Protection Act 1998 UK.
			Recall and define the 8 principles of the Data Protection Act.

		Recognise the need for an organisational data policy in relation to data governance.
	Data Structures Explore the fundamentals of data structures and database system design, implementation and maintenance.	Identify that data structure refers to formalised ways of identifying, accessing and manipulating data attributes by forming logical groupings of attributes.
		Explain the concepts behind relational database structures.
		Discuss how data warehousing and 'Big Data' (aka. NoSQL) structures address performance issues.
		Demonstrate why the variety of data structures requires a range of different data access and techniques.
	Database Design, Implementation and Maintenance Explore database system design, implementation and maintenance.	Apply data modelling techniques within database design, producing data models from different perspectives.
		Recognise the most common forms of database.
		Demonstrate how a logical data model can be transformed into a physical database design, including de-normalisation.
		Recognise that database maintenance is an activity designed to keep a database running smoothly and that a database can become sluggish and lose functionality otherwise.
		Illustrate the importance of maintaining a database by backing up the data securely.
	Data Architecture	Explain how an organisation's data architecture defines how data is stored, managed, used and integrated within an organisation and its database systems.

	Understand the organisation's data architecture.	Explain that metadata is data that defines the data an enterprise needs, stores and uses.
		Identify the need for a single enterprise view of data and how the canonical data model achieves this.
		Define the nature of the Data Architecture functions.
	The Domain Context for Data Analytics Explore the importance of the domain context for data analytics.	Illustrate the importance of domain knowledge to effective data analysis.
		Demonstrate the role of: • Decision analytics • Descriptive analytics • Predictive analytics • Prescriptive analytics

5. Assessment

5.1   Summary of assessment methods

The qualification is assessed in controlled exam conditions by a one-hour multiple-choice examination, consisting of 40 questions.

The exams are externally marked.

5.2   Availability of assessments

To be able to offer BCS Qualifications, you need to become a BCS Approved Training Provider.

All staff members who are involved in the management, invigilation and training must be registered with BCS. Suitably qualified individuals may be registered for more than one role. At least two members of staff must be registered with BCS in one of the roles in order for the Training Provider to retain Training Provider approval.

5.3   Grading

The exam has a pass mark of 65%.

5.4   Externally assessed units

External tests from BCS come in the form of automated tests. The tests offer instant results to the learner.

5.5   Specimen assessment materials

A sample test is available on the BCS Website.

5.6   Support materials

BCS provides the following resources specifically for these qualifications:

Description	How to access
Syllabus	Available on website
Sample tests	Available on website
Courseware	Available from approved third party providers

5.7   Access to Assessment

BCS seeks to provide equal Access to Assessment for all learners, ensuring that there are no unnecessary barriers to assessment and that any reasonable adjustments for learners preserve the validity, reliability and integrity of the qualification.

We will consider requests from BCS approved Training Providers for reasonable adjustments and special considerations to be approved for a learner. The decision will be based on the individual needs of the learner as assessed by suitably qualified professionals. In promoting this policy, BCS aims to ensure that a learner is not disadvantaged in relation to other learners and their certificate accurately reflects their attainment.

6. Contact Points

BCS Qualifications Client Services is committed to providing you with a professional service and support at all times through a single, dedicated point of contact. With a flexible and proactive approach, our team will work together with you to ensure we deliver quality solutions that are right for you.

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