Qualification Specification for the Knowledge Modules that form part of the BCS Level 4 Software Developer Apprenticeship

BCS Level 4 Diploma in Software Development Methodologies
BCS Level 4 Diploma in Software Languages

Version 5.0

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Contents

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, information the design of 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. 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
BCS Level 4 Diploma in Software Development Methodologies	**603/0543/5**	**30/09/2016**
BCS Level 4 Diploma in Software Languages	**603/0545/9**	**30/09/2016**

The two knowledge module qualifications listed above 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.

Apprentices must achieve one internationally recognised vendor or professional qualification, from the right hand column in the table below. This then exempts one of the Ofqual-regulated knowledge modules, as shown in the left hand column.

Knowledge Modules Vendor or Professional Qualifications.

BCS qualification	Vendor certification alternative chosen
BCS Level 4 Certificate in Software Development Methodologies	BCS Systems Development Essentials
BCS Level 4 Certificate in Software Languages	Cloud certified developer apache Hadoop C++ PHP Drupal Oracle SQL Developer Oracle Java Certified MCP.net MTA / MCP programming in HTML5 with JavaScript and CSS3 C#

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 Software Developer Digital IT Apprenticeship, to provide them with the technical knowledge and understanding they require for their role detailed below:

The primary role of a software developer is to build and test simple, high-quality code across front end, logic and database layers. A developer will typically be working as part of a larger team, in which they will have responsibility for some of the straightforward elements of the overall project. The developer will need to be able to interpret design documentation and specifications. The customer requirements will typically be defined and agreed by more experienced or specialist members of the team, such as a business analyst or technical architect.

3.3   Structure of the qualifications

This document covers the following qualifications which are used towards the Level 4 Software Developer Digital IT 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 Diploma in Software Development Methodologies
2. BCS Level 4 Diploma in Software Languages

Qualification Level 4 Descriptor	
Knowledge descriptor (the holder…)	Has factual, procedural and theoretical knowledge and understanding of a subject or field of work to complete tasks and address problems that while well-defined, may be complex and non-routine. Can interpret and evaluate relevant information and ideas. Is aware of the nature of the area of study or work. Is aware of different perspectives or approaches within the area of study or work.
Skills descriptor (the holder should have…)	- Logical and creative thinking skills - Analytical and problem solving skills - Ability to work independently and to take responsibility - Own initiative - A thorough and organised approach - Ability to work with a range of internal and external people - Ability to communicate effectively in a variety of situations - Maintain productive, professional and secure working environment.

3.4 Prior learning

The only pre-requisite to take the qualifications is enrolment on the Level 4 Software Developer Digital IT Apprenticeship.

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 Software Developer 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 assess 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)
BCS Level 4 Diploma in Software Development Methodologies	401 (280h + 120h + 1h)
BCS Level 4 Diploma in Software Languages	581 (360h + 220h + 1h)

4.2 Learning outcomes and assessment criteria

Qualification Name	Learning outcomes The learner will….	Assessment Criteria The learner can…
BCS Level 4 Software Development Methodologies	Lifecycle of systems development concepts.	Explain the role and function of the system development lifecycle.
		Relate the seven generic stages of the software development lifecycle. • Feasibility Study • Requirements Analysis • Design • Development • Testing • Implementation • Maintenance
		Show the main activities in each stage of the software development lifecycle.
		Demonstrate the high-level deliverables from each stage of the software development lifecycle.
	Software development methodologies.	Describe the primary differences between the waterfall and agile software development methods.
		Explain the respective strengths and weaknesses of each of the waterfall and agile software development methods.
		Explain the respective strengths & weaknesses for using either the waterfall or agile software development method in a given case.
	Data roles and responsibilities.	Relate the roles and responsibilities within software development and implementation (for example, but not limited to, analysts, designers, developers, testers and technical architects).

Qualification Name	Learning outcomes The learner will….	Assessment Criteria The learner can…
		Explain the structure within software development and implantation.
		Explain the structure of a software development team within an organisation.
		Explain the team-working aspects that are needed to ensure effective delivery of projects.

Qualification Name	Learning outcomes The learner will….	Assessment Criteria The learner can…
BCS Level 4 Diploma in Software Languages	Software Design	Demonstrate an understanding of the purpose of software design: • To aid Communication between 'actors'. • As a basis for rigorous development. • To provide a standard approach. • To ensure consistency across the development. • To assist in the identification of re-use. • To compare the current situation with the required.
		Understand and apply the use of software design approaches and software patterns in the software design process.
		Explain the rationale for separating functional and non-functional requirements.
		Show how software designs can be documented including how the design documents will be used to support software implementation.
		Demonstrate the need for secure development and give examples of how this can be included within the software implementation process.
		Discover the need for software maintainability and how software can be implemented in a manner that enables re-use and maintainability.
	Computational Theory and Mathematics	Explain and demonstrate the following key techniques of maths required for software development: Decomposition • decomposition; • pattern recognition; • abstraction; • algorithms; • mathematical logic.

		Demonstrate how algorithms are used to create a logical solution to a computable problem: • The use of semi-formal specification of algorithms, based on a simplified computer model. • Development of code from an algorithm. • The use of operators in algorithms, including arithmetic (+; -; *; /; %); assignment (=); relational (==; >; <; !=; >=; <=); logical (&&; ||, !); bitwise; incremental.
		Apply the primary elements of programming logic.

5. Assessment

5.1 Summary of assessment methods

The qualification is assessed in controlled exam conditions using 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%.

Please note: Whilst BCS would not normally want to make changes to either grade thresholds or grading algorithms there is potential for them to change in order to maintain standards.

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

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 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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