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BCS International Diploma in Solution Development Syllabus

**Version 3.0
January 2019**

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Change History

Any changes made to the syllabus shall be clearly documented with a change history log. This shall include the latest version number, date of the amendment and changes made. The purpose is to identify quickly what changes have been made.

Version Number	Changes Made
Version 3.0 January 2019	Re-structured knowledge areas to reduce from 7 to 6 and remove the knowledge-based specialism knowledge area. Refreshed reading list. Included definitions for Bloom knowledge levels. Improved consistency with International Diploma in Business Analysis syllabus. Systems Modelling Techniques and Deployment knowledge areas expanded to clarify expectations for examiners and candidates.
Version 2.2 October 2014	Updated language requirements for additional time and use of dictionaries.
Version 2.1 June 2012	Added the word 'International' to the qualification title
Version V2.0 May 2012	Removed references to ISEB. Added in Section 2.8 and Section 3. Added more to Sections 3.1 – 3.6. Removed the reference to IT Architecture.
Version 1.2	Updated logos

Rationale/Background

The oral examination for the BCS International Diploma in Solution Development is taken by candidates on successful completion of a set of written examinations. It focuses on the application of their knowledge and also provides an opportunity to assess their interpersonal and problem-solving skills. This is the highest level qualification within the solution development section of the Professional Certifications qualifications portfolio.

Aims and Objectives

The BCS International Diploma in Solution Development provides a professional qualification for practitioners working in systems development and related disciplines. Holders of the qualification will have had to demonstrate competency in a range of skills and techniques and will have passed examinations that assess performance across knowledge levels 2-5.

Target Group

This qualification is aimed at practising solution development professionals from a range of disciplines including, but not limited to, software engineering, solutions architecture, software testing, business analysis and IT service delivery, who wish to gain a detailed understanding of solution development best practice.

Entry Criteria

The entry criteria for this examination are:

- Examination passes in the BCS Certificates in Systems Development Essentials and Systems Modelling Techniques
- An examination pass in one of the knowledge-based specialist modules defined below.
- An examination pass in one of the practitioner specialist modules defined below.

It is recommended that candidates sit the oral examination within twelve months of completing the pre-requisite modules.

Knowledge-Based Specialist Modules

BCS Foundation Certificate in Systems Development
BCS Intermediate Certificate in Enterprise and Solution Architecture
ISTQB Certified Tester Foundation Level
Foundation Certificate in VeriSM™

Practitioner Specialist Modules

BCS Practitioner Certificate in Business Analysis Practice
BCS Practitioner Certificate in Systems Design Techniques
BCS Practitioner Certificate in Enterprise and Solution Architecture
BCS Practitioner Certificate in Integrating Off-the-Shelf Software Solutions

Structure of the Examination

The examination is conducted by two oral examiners and lasts for 50 minutes. Candidates are not allowed to take any written material into the oral examination. The questions are concerned with the application of the solution development techniques and approaches defined in this syllabus and the practitioner specialist module syllabus nominated by the candidate.

Objectives of the Oral Examination

The objectives of this oral examination are:

- To assess the candidate's level of knowledge of the solution development topics defined in this syllabus.
- To assess the candidate's ability to apply the solution development techniques defined in this syllabus.

Examination and Training Provider Information

This qualification is examined and awarded by BCS and there is no training pre-requisite for the written or oral examinations. However, where the oral examiners identify omissions or errors in the training provided by accredited BCS Examination Providers or BCS Training Organisations, feedback regarding such issues will be provided to the relevant provider/organisation.

Candidate Information

Candidates are not required to attend training courses prior to sitting the oral examination. However, it is recommended that candidates revise thoroughly the subject areas identified in the syllabus content below. Although attendance at an Oral Examination Preparation Day offered by an accredited training provider is not mandatory, attendance is strongly recommended to gain a better understanding of the structure and format of the oral examination. An oral preparation day will also help candidates understand the rationale for the questioning approach adopted by the oral examiners.

Candidates who pass the oral examination are awarded the International Diploma in Solution Development. Candidates who fail the oral examination are provided with feedback that identifies the particular areas of weakness identified during the oral examination.

Additional time for candidates due to a disability

Candidates who have a disability which may impact their ability to take and pass the oral interview may be eligible for additional time. An example would be if a candidate has a speech impediment. Please advise BCS at the time of booking the oral examination.

Where candidates have been granted extra time during the oral examination, BCS will try to allocate the final interview slot of the day so that there are fewer time restrictions. Please inform BCS as early as possible so that this time slot can be allocated. In exceptional circumstances, it may be possible to allow written responses to the interview questions.

Syllabus

The syllabus is structured into sections relating to major subject headings and numbered with a single digit section number. The syllabus content identifies the subject areas and topics to be examined. The knowledge (K) level from Bloom's Taxonomy is shown for each subject area. Bloom's Taxonomy is explained in a later section of this syllabus.

Note: *The candidate will have studied a specific development approach and questions related to sections 2, 3, and 4 of this syllabus may be specific to the selected approach.*

1. Solution development principles (K Level 4/5)

- 1.1. The rationale for solution development
 - 1.1.1. The reasons for initiating a solution development project
 - 1.1.2. Inputs to a solution development project
- 1.2. Relationship between solution development and other disciplines
 - 1.2.1. Business analysis
 - 1.2.2. Software development / software engineering
 - 1.2.3. Software testing
 - 1.2.4. Service management (including DevOps)
 - 1.2.5. Solution architecture
 - 1.2.6. Project management
- 1.3. Solution development approaches
 - 1.3.1. Bespoke – including linear and iterative (Agile) approaches
 - 1.3.2. COTS (Commercial Off-the-Shelf) and MOTS (Modified Off-the-Shelf)
 - 1.3.3. Component based
- 1.4. Solution development lifecycles
 - 1.4.1. Waterfall
 - 1.4.2. V-model
 - 1.4.3. Iterative/evolutionary
- 1.5. Roles and responsibilities
 - 1.5.1. Business analyst
 - 1.5.2. Solution architect
 - 1.5.3. Solution designer/software architect
 - 1.5.4. Solution developer
 - 1.5.5. Solution tester
 - 1.5.6. End user
 - 1.5.7. Subject-matter expert (SME)
 - 1.5.8. Product owner
 - 1.5.9. Project manager
 - 1.5.10. Project sponsor
- 1.6. Professionalism and solution development
 - 1.6.1. The role of BCS in professional development
 - 1.6.2. The importance of a code of conduct/ professional standards

2. Solution development practices (K Level 4/5)

- 2.1. Requirements engineering
 - 2.1.1. System investigation techniques
 - 2.1.1.1. Interviews
 - 2.1.1.2. Workshops
 - 2.1.1.3. Document analysis
 - 2.1.1.4. Scenario analysis
 - 2.1.1.5. Surveys
 - 2.1.1.6. Focus groups
 - 2.1.2. Requirement types
 - 2.1.2.1. Business requirements (general and technical)
 - 2.1.2.2. Solution requirements (functional and non-functional)
 - 2.1.3. Defining requirements
 - 2.1.3.1. Requirements catalogue
 - 2.1.3.2. User stories
 - 2.1.3.3. Use cases
 - 2.1.3.4. Data models
- 2.2. Prioritisation (using an industry standard technique)
 - 2.2.1. Prioritisation within a linear development lifecycle
 - 2.2.2. Prioritisation within an iterative development lifecycle
- 2.3. Prototyping
 - 2.3.1. Evolutionary prototypes versus throwaway prototypes
 - 2.3.2. Story-boards & wireframes
 - 2.3.3. Benefits of prototyping
 - 2.3.3.1. Proof of concept
 - 2.3.3.2. Requirements visualisation
 - 2.3.4. Risks of using prototyping

3. Systems modelling techniques (K Level 4/5)

Note: *The candidate will have studied either a structured approach to modelling or the Unified Modeling Language (sic) and the examiner will determine which approach to examine the candidate on accordingly. Alternative notations are provided below.*

- 3.1. Use of models within systems development
 - 3.1.1. System definition – defining system requirements
 - 3.1.2. System design – specifying how requirements are realised
 - 3.1.3. System testing – deriving test conditions from models
 - 3.1.4. Use of models to depict the logical and physical aspects of a system.
- 3.2. Modelling different views of a system
 - 3.2.1. Rationale for modelling different views of a system
 - 3.2.2. Three representative views: data, functionality and dynamic behaviour
- 3.3. Modelling system data
 - 3.3.1. Notation for modelling system data – Class diagram (UML) or Entity-Relationship diagram (structured)

- 3.4. Modelling system functionality
 - 3.4.1. Notation for modelling system functionality – Use Case diagram & supporting Use Case descriptions (UML) or Data Flow diagram & supporting Elementary Process Descriptions (structured)
- 3.5. Modelling dynamic system behaviour
 - 3.5.1. Notation for modelling the system response to events – State Machine diagram (UML) or Entity Life History (structured)
 - 3.5.2. Notation for modelling how the system realises functional requirements – interaction diagrams (UML) or flowcharts / pseudo-code / structured English (structured)
- 3.6. Cross-checking of models
 - 3.6.1. Rationale for cross-checking of models
 - 3.6.2. Cross-checking of data and functionality using a CRUD matrix
 - 3.6.3. Cross-checking of data and events using a CRUD matrix

4. Design and quality assurance (K Level 4/5)

- 4.1. Elements of system design
 - 4.1.1. Input and output design (including user-interface design)
 - 4.1.2. Data design
 - 4.1.3. Process design
- 4.2. System controls
 - 4.2.1. Verification and validation
 - 4.2.2. Security
- 4.3. Quality assurance
 - 4.3.1. Software testing (static testing and dynamic testing)
 - 4.3.2. Quality reviews (including static testing)
 - 4.3.3. Solution evaluation (including post implementation reviews)
 - 4.3.4. Service level agreements

5. Deployment and maintenance (K Level 4/5)

- 5.1. Release management
 - 5.1.1. Planning and communicating the deployment
 - 5.1.2. Data take-on and migration (including data mapping and data transformation)
 - 5.1.3. Packaging the release (to include hardware, software, documentation)
 - 5.1.4. Back out plans
 - 5.1.5. Post-implementation reviews (monitoring and confirming successful deployment)
- 5.2. Deployment approaches
 - 5.2.1. Distributing and deploying software artefacts
 - 5.2.1.1. Distribution
 - 5.2.1.2. Installation (including removal of redundant items)
 - 5.2.1.3. Activation (including de-activation)
 - 5.2.2. Changeover strategies
 - 5.2.2.1. Direct changeover (big bang)
 - 5.2.2.2. Parallel running
 - 5.2.2.3. Phased
 - 5.2.2.4. Pilot

- 5.3. Managing changes to the solution
 - 5.3.1. Types of software maintenance (corrective, adaptive, perfective, preventative)
 - 5.3.2. Change control process
 - 5.3.3. Configuration management and version control

- 5.4. Software tools to support solution development
 - 5.4.1. Requirements Management
 - 5.4.2. Visual Modelling
 - 5.4.3. Forward and reverse engineering
 - 5.4.4. Change and release management (including configuration management)
 - 5.4.5. Quality management (test design, test execution, test management)
 - 5.4.6. Integrated development environments (source code editors, compilers, debuggers, wireframes)

6. Practitioner specialism (K Level 2/3)

- 6.1. Relevance of the selected module to solution development
- 6.2. Description of the chosen approach and techniques
- 6.3. Application of the chosen approach and techniques

Terminology Used

The terminology used in the oral examination will conform to that adopted in BCS publications on solution development and related disciplines (see reading list at the end of this syllabus).

Levels of Knowledge

Each section of this syllabus has been assigned a knowledge level based upon Bloom's taxonomy of knowledge in the cognitive domain (ref Taxonomy of Educational Objectives, Handbook 1 – The Cognitive Domain, Bloom et al., New York 1956). Bloom defined six levels of knowledge, which can be broadly interpreted as per the table below.

Level	Levels of Knowledge
K6	Evaluate
K5	Synthesise
K4	Analyse
K3	Apply
K2	Understand
K1	Remember

The knowledge levels that apply to this syllabus are K2 – K5, which means that examination questions will test the candidate's understanding of the relevant syllabus topics at these levels only.

Example questions for each level are provided below.

Level	Sample question
K2	During prioritisation a requirement has been determined to be mandatory but could be deferred for a short time if necessary because there is a short-term workaround. Which of the following MoSCoW ratings should the requirement be assigned?
K3	In the scenario just described, what investigation techniques could be used to investigate the system requirements in order to provide further clarity for the developers to build from, and why?
K4/5	If you were to consider the most appropriate approach to developing a solution to meet the needs of this business, how would you decide?

Examination Format

Type	Oral
Duration	50 minutes. Candidates are able to request additional time if they have a disability that would impact them during an oral examination, such as a speech impediment.
Pre-Requisite for course and/or exam	Candidates must have passed written examinations in the two core modules, one knowledge-based specialist module and one practitioner specialist module.
Invigilated/Proctored	No. Conducted by two oral examiners.
Closed	Yes. Reading material is not to be used during the oral interview.
Pass Mark	Pass or fail
Delivery	Interview by two oral examiners

Reading List

It is the responsibility of the oral examination candidate to ensure that they possess sufficient knowledge and understanding of the topic areas defined in sections 1-6 of the syllabus above. The reading list below is provided to support candidates in their study and revision for the oral examination.

Recommended Reading

Title: Developing Information Systems: Practical Guidance for It Professionals

Author: James Cadle (editor)

Publisher: BCS

Publication Date: August 2014

ISBN: 978-1780172453

URL: <http://shop.bcs.org>

Additional Reading

Title: [UML 2 and the Unified Process \(2nd Edition\)](#)

Author: Jim Arlow and Ila Neustadt

Publisher: Addison-Wesley

Publication Date: June 2005

ISBN: 978-0321321275

Title: Business Analysis (Third Edition)

Author: Debra Paul, Donald Yeates and James Cadle

Publisher: BCS

Publication Date: September 2014

ISBN: 978-1780172774

URL: <http://shop.bcs.org>

Title: Software Testing: An ISTQB-BCS Certified Tester Foundation Guide (Third Edition)

Author: Brian Hambling (editor)

Publisher: BCS

Publication Date: June 2015

ISBN: 978-1780172996

URL: <http://shop.bcs.org>

Title: [Enterprise Architecture at Work \(Modelling, Communication and Analysis\)](#)

Author: Mark Lankhorst et al

Publisher: Springer

Publication Date: March 2017

ISBN: 978-3662539323

Title: Off-The-Shelf IT Solutions: A practitioner's guide to selection and procurement

Author: Martin Tate

Publisher: BCS

Publication Date: March 2015

ISBN: 978-1780172583

URL: <http://shop.bcs.org>

Title: Agile Foundations: Principles, practices and frameworks
Author: Peter Measey (editor)
Publisher: BCS
Publication Date: March 2015
ISBN: 978-1780172545
URL: <http://shop.bcs.org>