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BCS Certificate in Systems Development Essentials Syllabus

Version 2.5
December 2016

This professional certification is not regulated by the following United Kingdom Regulators - Ofqual, Qualification in Wales, CCEA or SQA

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 and Date	Changes Made
Version 2.5 December 2016	Strapline regarding regulated statement has been added
Version 2.4 March 2015	Updated language requirements for additional time and use of dictionaries.
Version 2.2 September 2012	Updated the Reasonable Adjustments Requirements Added a section to cover excerpts from BCS books
Version 2.1 August 2012	Added in details of extra time for foreign language candidates
Version 2.0 August 2011	Updated BCS logos and strapline. Added table of contents, levels of knowledge, levels of skill and responsibility, format of the examination, change history and definition of terminology. Technical Changes: • Minor restructuring to the sequence of the syllabus • Clarification of the importance of being able to select a particular approach and to use a specific chosen method in detail • Addition of Application Lifecycle Management to the CASE tool section • Need to differentiate between logical and physical models • Refresh of roles and addition of the need to understand team structures • Clarification of Agile Approach • Made more consistent with the BCS architecture qualifications • Reduction of percentage on systems investigation and increase on methodologies • Acronym COTS explained • Bespoke development added • Section 5.6 removed – duplication of Section 5.5 • Expanded Section Heading 1.3

BCS Certificate in Systems Development Essentials

Contents

Introduction

This certificate is concerned with the fundamental skills of systems development. Its focus is on systems life cycles, systems investigation, modelling and quality assurance as it is perceived that these underpin all systems development. The certificate also introduces the candidate to how the systems development effort could be organised. The syllabus distinguishes between generic lifecycle types, methods and approaches.

The syllabus requires the candidate to contrast various generic development lifecycles, defining the advantages and disadvantages of each in order to select the most appropriate approach for a specific situation. It then requires that ONE development lifecycle be addressed in detail in the context of a selected method or approach. So, for example, a candidate may wish to consider the Unified Process, Scrum or DSDM as an example of an Agile approach.

For the selected approach, the syllabus requires that the candidate should be able to describe:

- The structure (for example, milestones/stages/phases)
- The activities (for example, the workflows or detailed steps/tasks described within an approach)
- The key roles involved in the chosen approach and how may be arranged into teams
- Three selected primary models associated with the chosen method. For example, process, data and simple event models form a structured approach or use case diagram, class diagram and simple state diagrams in an object oriented approach

  For each model the candidate should be able to:
  - Describe the modelling notation
  - Interpret a model
  - Cross reference the model with other models
  - Quality assure a model against standards and requirements

Candidates would also be expected to describe the principles of the development approaches defined in the syllabus. One of the objectives

Eligibility for the Examination

There are no specific pre-requisites for entry to the examination; however candidates should possess the appropriate level of knowledge to fulfil the objective shown below.

Format of the Examination

The format for the examination is a one hour written (open book) examination based on a business scenario with 15 minutes reading time. The pass mark is 50%.

Objectives

The candidate should be able to;

- Identify the tasks and disciplines required for systems development and the implementation of the development
- Describe the relationship between systems development and the wider term solution development
- Interpret the business requirements and produce systems requirements
- Describe the commonly used development lifecycles defined in the syllabus
- Select a particular development lifecycle based on specific characteristics
- Describe in detail one method that embraces one (or more) of these generic lifecycles
- Describe the structure, activities and deliverables of this method
- Identify the key roles and responsibilities within the chosen method and describe how these can be used to form teams
- Describe, interpret and quality assure the key models that the selected method uses for defining the process, static and event processes of the system
- Explain the differences between logical and physical models
- Make effective use of different methods of interpersonal communications
- Quality assure the systems requirements documentation and models
- Identify different architectures for systems development solutions
- Conduct a quality review
- Explain how CASE, CAST and Application Management tools might be used to support the chosen method

Duration and Format of the Course

Candidates can study for this certificate in two ways: by attending a training course provided by an Examination Provider organisation or by self-study. A training course will require a minimum of 21 hours of study run over a minimum of three days. The course can be delivered a number of different ways from traditional class-room based training to online e-learning.

Providers can submit their own approaches and lifecycles for accreditation provided that they show how all aspects of the syllabus are handled in their proposed approach.

Candidates will not be expected to construct the models in the examination for this certificate. Construction of these models will be examined in Systems Modelling Techniques.

Additional time for candidates requiring Reasonable Adjustments due to a disability

Candidates may request additional time if they require reasonable adjustments in line with the BCS reasonable adjustments policy. It will be the Examination Provider's responsibility to make a decision regarding candidate eligibility and keep a record of the decision. This is subject to audit by BCS.

Additional time for candidates whose language is not the language of the examination

If the examination is taken in a language that is not the candidate's native / official language then they are entitled to 25% extra time.

If the examination is taken in a language that is not the candidate's native / official language then they are entitled to use their own **paper** language dictionary (whose purpose is translation between the examination language and another national language) during the examination. Electronic versions of dictionaries will **not** be allowed into the examination room.

Excerpts from BCS Books

Examination Providers may include excerpts from BCS books in the course materials. If you wish to use excerpts from the books you will need a license from BCS to do this. If you are interested in taking out a licence to use BCS published material you should contact the Head of Publishing at BCS outlining the material you wish to copy and the use to which it will be put.

Syllabus

1. System Development roles and responsibilities (10%)

Examinable in both multiple choice and practitioner open book

1.1 Identify the Actors/Roles and Responsibilities within system development and implementation (for example, analysts, designers, developers, testers and technical architects)
1.2 Characteristics of these roles
1.3 Team structure

2. Architecture (5%)

Examinable as multiple choice, but difficult to examine in a practitioner open book exam

2.1 Different levels of architecture – Enterprise, Business, Solution, Infrastructure (networks, databases)
2.2 Inputs at Enterprise level
2.3 Inputs at Solution and Infrastructure level
2.4 Impacts of design decisions

3. Systems Development Lifecycles (15%)

Examinable in both multiple choice and practitioner open book

3.1 Waterfall
3.2 V Model
3.3 Incremental or phased delivery
3.4 Spiral or iterative
3.5 Advantages and disadvantages of each approach
3.6 Selection of an appropriate approach on defined characteristics

4. Development Practices (10%)

Examinable in both multiple choice and practitioner open book

4.1 Bespoke development
4.2 Evolutionary / Agile
4.3 Prototyping
4.4 Component based development
4.5 Software Package solutions (COTS Commercial off-the-shelf)

5. Methods (20%)

Examinable in both multiple choice and practitioner open book.
However, the methods are chosen by the Examination Provider so each Provider will set questions for their chosen method.

If this module were to be centralised and offered as a multiple choice then different sets of questions would need to be produced for each possible method (e.g. Iterative, prototyping, DSDM,).

This and all subsequent sections of the syllabus should be covered in the light of the specific chosen method.

5.1 Structure and content of a chosen representative method
5.2 Describe and interpret three representation models from the method, showing at least:
- Process perspective
- Data perspective
- Event perspective

5.3 Explain how these models can be used to depict the logical and physical aspects of a system
5.4 Roles and team structures within the chosen method
5.5 Products within a chosen method

6 Systems Investigation (10%)

Examinable in both multiple choice and practitioner open book

6.1 Fact finding approaches:
- Workshops
- Prototyping
- Interviewing
- Questionnaires (for usability or package selection for example)
- Scenario analysis

6.2 Functional requirements definition
6.3 Non-functional requirements definition
6.4 Documenting system requirements
6.5 Human aspects of systems investigation and introducing change

7 System Design, Deployment and Maintenance (10%)

Examinable in both multiple choice and practitioner open book

7.1 Controls and security
7.2 Verification and validation
7.3 Interface design
7.4 Design principles and constraints (legal, ethical, financial)
7.5 Different types of implementation
7.6 Sign off and deployment
7.7 Post implementation reviews
7.8 Different types of maintenance and support

8 Quality Assurance (15%)

Examinable in both multiple choice and practitioner open book

8.1 Definitions of quality
8.2 Requirements driven testing
8.3 Types of walkthrough and inspection
8.4 Post Project Reviews
8.5 Service Level Agreements

9 CASE, CAST, Application Lifecycle Management tools (5%)

Examinable in both multiple choice and practitioner open book

9.1 Software support for systems development
9.2 Features of CASE and CAST tools
9.3 Features of Application Lifecycle Management
9.4 Lifecycle coverage
9.5 Configuration and version control

Levels of Knowledge / SFIA Levels

This course will provide candidates with the levels of difficulty / knowledge skill highlighted within the following table, enabling them to develop the skills to operate at the levels of responsibility indicated.

The levels of knowledge and SFIA levels are explained in on the website www.bcs.org/levels

The levels of knowledge above will enable candidates to develop the following levels of skill to be able to operate at the following levels of responsibility (as defined within the SFIA framework) within their workplace:

Level	Levels of Knowledge	Levels of Skill and Responsibility (SFIA)
K7		Set strategy, inspire and mobilise
K6	Evaluate	Initiate and influence
K5	Synthesise	Ensure and advise
K4	Analyse	Enable
K3	Apply	Apply
K2	Understand	Assist
K1	Remember	Follow

Format of the Examination

Type	Written examination based on a business scenario
Duration	1 hour preceded by 15 minutes reading time. Candidates are entitled to an additional 15 minutes if they are sitting an examination in a language that is not their native/official language
Pre-requisites	None
Supervised / Invigilated	Yes
Open Book	Yes
Pass Mark	50%
Distinction Mark	None
Delivery	Paper based examination

Recommended Reading List

Title: UML 2 and the Unified Process: Practical Object-Oriented Analysis and Design (2nd Edition)
Author: Jim Arlow and Ila Neustadt
Publisher: Addison Wesley
Publication: June 2005
ISBN: 0321321278

Title: Design Patterns- Elements of Reusable object-oriented software
Author: Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides
Publisher: Addison Wesley
Publication: October 1994
ISBN: 0201633612

Title: Requirements Analysis and Systems Design (3rd Edition)
Author: Leszek Maciaszek
Publisher: Addison Wesley
Publication: June 2007
ISBN: 0321440366

Title: Classical and Object-Oriented Software Engineering (8th Edition)
Author: Stephen Schach
Publisher: McGraw-Hill
Publication: December 2010
ISBN: 0071222081

Title: Introducing Systems Development
Author: Steve Skidmore and Malcolm Eva
Publisher: Palgrave Macmillan
Publication: August 2003
ISBN: 0333973690

Title: Systems Analysis and Design
Author: Don Yeates and Tony Wakefield
Publisher: FT Prentice Hall
Publication: September 2003
ISBN: 0273655361