



BCS Practitioner Certificate in Enterprise and Solution Architecture Syllabus

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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 4.5 April 2017	Standardised new template format adopted, with revised ToC. K levels added
Version 4.4 December 2016	Strapline regarding regulated statement has been added
Version 4.3 March 2015	Updated language requirements for additional time and use of dictionaries. Changed the format of the syllabus so that it reflects the standard format. Standardised the trainer requirements
Version 4.2 October 2013	Trainer requirements added to show minimum pass rate
V4.1 July 2012	Added in details of extra time for foreign language candidates
V4.0 January 2012	Updated Page 9 pre-requisites for Practitioner entry level – previously stated candidates needed to have attended the ‘course’ should say candidates have passed the Intermediate exam prior to taking the Practitioner. Changed ISEB for BCS logos and removed ISEB from syllabus.
V3.0 October 2010	Added more information to Data Classification Category. Changed the pass rate on Practitioner level from 60% (24/40) to 26/40. Changed Distinction level on Practitioner level from 80% to N/A. Added Change Log in the main body of the syllabus.
V2.0 July 2010	Added in trainer criteria for new trainers. This is not a retrospective requirement. Effective July 2010.
V1.1 January 2010	Signed off and approved.
Version 0.1 November 2015	Syllabus Created

Introduction

This certificate covers the range of concepts, approaches and techniques that are applicable to the BCS Practitioner Certificate in Enterprise and Solution Architecture.

Candidates are required to demonstrate their knowledge and understanding of these aspects of BCS Practitioner Certificate in Enterprise and Solution Architecture.

Objectives

Practitioner level training and examinations elaborate on the more practical parts of the syllabus, and focus on the practical application of the knowledge to a case study.

Candidates should be able to demonstrate knowledge and understanding of enterprise and solution architecture principles and techniques. Key areas are:

- Intermediate level concepts, including architecture processes and descriptions
- The ability to demonstrate and apply this knowledge to a case study that involves producing deliverables in the following areas:
 - architecture precursors: goals, directives and scope
 - architecture descriptions: business, data, applications and infrastructure architecture

They will also be able to demonstrate knowledge and understanding of architecture management techniques in the areas of migration planning, implementation, change management and governance.

Target Audience

The certificate is relevant to anyone requiring an understanding of enterprise and solution architecture at a practitioner level.

Course Format and Duration

Candidates can study for this certificate in two ways: by attending an accredited training course provided by Accredited Training Organisation or by self-study. An accredited training course will require a minimum of 18 hours of study run over a minimum of three days.

Eligibility for the Examination

It is recommended that candidates have more than 6 years' experience of IS/IT work, including some architecture definition. Candidates must hold the BCS Intermediate Certificate in Enterprise and Solution Architecture, or have a TOGAF certificate and have studied the BCS Intermediate Level syllabus before attending.

Duration and Format of the Examination

- One hour 'closed book'
- 40 multiple choice questions
- Pass mark is 26/40 (65%)

Additional time

For candidates requiring reasonable adjustments

Please refer to the [reasonable adjustments policy](#) for detailed information on how and when to apply.

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, candidates are entitled to:

- 25% extra time
- 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

Guidelines for Accredited Training Organisations

Each major subject heading in this syllabus is assigned an allocated time. The purpose of this is two-fold: first, to give both guidance on the relative proportion of time to be allocated to each section of an accredited course and an approximate minimum time for the teaching of each section; second, to guide the proportion of questions in the exam. Accredited Training Organisations may spend more time than is indicated and candidates may spend more time again in reading and research. Courses do not have to follow the same order as the syllabus. Courses may be run as a single module or broken down into two or three smaller modules.

This syllabus is structured into sections relating to major subject headings and numbered with a single digit section number. Each section is allocated a minimum contact time for presentation.

The syllabus contains references to established standards. The use of referenced standards in the preparation of training material is mandatory. Each standard used must be the version quoted in the current version of this syllabus.

Training materials should be consistent with the terms and definitions contained in the syllabus and reference model. Accredited Training Organisations may use sources that use the same terms with different meanings, but should in this case explain any terminology clashes to candidates.

Accredited Training Organisations are free to decide:

- the "process" that candidates are taught at the Intermediate level and apply to the case study in the practitioner level, and
- the notations used in architecture models and descriptions

Practitioner level training must remind people of Intermediate-level knowledge and exemplify best practice (up to 50%) and lead the candidates through a practical case study (at least 50%).

Use of Calculators

No calculators or mobile technology are acceptable.

On the breadth of an architect's role

Architect roles are broad, and the enterprise or solution architect must be a generalist. No syllabus, training course or examination can be enough to make an architect. The role requires extensive experience on a variety of projects.

In this document, the terms “architect” and “architecture” apply principally to enterprise and solution architects working in relation to Information Systems and Technologies. The role played by architects in these roles is broad – spanning the spectrum from business concerns to information technologies.

Note especially that while most sections of the syllabus are divided into foundation or intermediate levels, each level of certification embraces the level below. So, while there is no foundation level examination, there are many foundation level concepts, and these may appear in intermediate level examinations. It is expected that candidates will understand most if not all the foundation-level concepts before attending a training course, and that Accredited Training Organisations may cover foundation-level concepts relatively briefly.

This means they remember and understand all the terms defined in the syllabus, at all levels. In addition, from the following sections:

2. **Architecture Precursors:** The practitioner should be able to define SMART goals and business cases, and identify risks relating to non-functional requirements
3. **Architecture Frameworks:** The practitioner should be aware of alternative frameworks and comprehend one framework in more depth
4. **Business Architecture:** The practitioner should be able to describe business architecture building blocks, models and views
5. **Data Architecture:** The practitioner should be able to describe data architecture building blocks, models and views
7. **Applications architecture:** The practitioner should be able to describe an applications architecture
8. **Design for NFRs:** The practitioner should be able to design or redesign a solution to meet non-functional requirements
9. **Infrastructure architecture:** The practitioner should be able to outline an infrastructure in sufficient detail for technical/infrastructure architects to complete
10. **Migration planning:** The practitioner should be able to plan an architecture migration, alongside managers using standard management planning processes
11. **Architecture management:** The practitioner should be able to govern the implementation of an architecture

Syllabus

For each top-level area of the syllabus a percentage and K level is identified. The percentage is the exam coverage of that area, and the K level identifies the maximum level of knowledge that may be examined for that area.

1. Architecture and Architects (K2, 0.5 Hours)

Recognise the work and roles involved in describing the architecture (the high-level design) of business systems and the information systems that support them. (Not, in this context, work and roles related to buildings).

Learning Objectives

- 1.1 Discuss the practical use of the concepts above and apply them a case study
- 1.2 Draw analogies between human activity systems and software systems
- 1.3 Recognise the limits to these analogies

2. Architecture Precursors (K3, 2.5 Hours)

Recognise the various inputs, statements of requirements and constraints that guide an architect as to the nature and shape of solutions to be built. Recognise the information that may be needed in a statement of architecture work.

Learning Objectives

- 2.1 Discuss the practical use of the concepts above and apply them a case study

3. Architecture Frameworks (K3, 2 Hours)

Recognise methodologies designed to help people create architecture descriptions and use them to good effect. Distinguish a development process (a process framework) from a classification of architecture descriptions (a description framework).

Learning Objectives

- 3.1 Discuss the practical use of the concepts above and apply them a case study

4. Business Architecture (K3, 2 Hours)

Recognise ways to describe the structure and behaviour of a business system (not necessarily related to computers), covering business functions or capabilities, business processes and the roles of the actors involved.

Recognise how to map business functions and business processes to each other, to the business goals and business services they support, and to the applications and data they need.

Learning Objectives

- 4.1 Discuss the practical use of the concepts above and apply them a case study

5. Data Architecture (K3, 2 Hours)

Recognise ways to describe the data structures used by a business and/or its applications, including meta data: that is, descriptions of data in storage, data in motion, data structures and data items. Recognise mappings of data objects to data qualities, applications, technologies etc.

Recognise information architecture can embrace not only data architecture but also knowledge/content management.

Learning Objectives

- 5.1 Discuss the practical use of the concepts above and apply them a case study

6. Software Architecture (K3, 1 Hour)

Recognise ways to modularise the internal structure of an application, and ways to connect components, ranging from tightly coupled to loosely-coupled.

7. Applications Architecture (K2, 2 Hours)

Recognise ways to describe the structure and behaviour of applications used in a business, with a focus on how they interact with each other and with business users or actors.

Recognise the need for enterprise and solution architects to focus on data consumed and produced by applications rather than their internal structure. Recognise mappings of applications to business functions they support and to application platform technologies they need.

Learning Objectives

- 7.1 Discuss the practical use of the concepts above and apply them a case study

8. Design for NFRs (K2, 1 Hour)

Learning Objectives

- 8.1** Discuss the practical use of the concepts above and refer to them during a case study

9. Infrastructure Architecture (K3, 2 Hours)

Recognise ways to describe the structure and behaviour of the technology platform that underpins user applications: covering the client and server nodes of the hardware configuration, the platform applications that run on them, the platform services they offer to applications, and the protocols and networks that connect applications and nodes.

Learning Objectives

- 9.1** Discuss the practical use of the concepts above and apply them a case study

10. Migration Planning (K2, 1 Hour)

Recognise the process of turning baseline and target architecture descriptions into a plan for a programme or project, and the contributions made by architects to programme/project planning.

Recognise the need to integrate architectural planning activities with programme/project management offices approaches such as MSP, PRINCE2 and PMI.

Learning Objectives

- 10.1** Recognise the use of analysis techniques such as gap analysis, and critical path analysis in defining a migration path
- 10.2** Recognise the formation of a roadmap with time, costs and resources, from a migration path
- 10.3** Recognise the need to maintain a RAID catalogue and work alongside managers using methods for programme and project management

11. Architecture Management (K2, 2 Hours)

Recognise the organisations and processes needed to govern and implement an architecture description, both in development and in operation, including the management of changes.

Learning Objectives

Architecture implementation

- 11.1** Distinguish three varieties of Software Development Life Cycle (SDLC): Waterfall, Iterative Development and Agile Development.

Architecture change management

- 11.2** Recognise the need for and concepts used in architecture change management: baseline configuration, configuration item, change management, change control, request for change (rfc), impact analysis, configuration management

Architecture governance

- 11.3** Recognise the need for and concepts used in architecture governance: architecture board, architecture contract, governing architect, architecture compliance review, architecture review checklist, architecture conformance level, architecture compliance level, dispensation, capability maturity model.

Architecture in operations

- 11.4** Recognise approaches used to manage the architecture in operations: COBIT, IT services management (ITSM), Information technology Infrastructure Library (ITIL), IT Configuration Management Database (CMDB), Common Information Model (CIM), Problem and help-desk management and Systems management.

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

Question Weighting

Section Number	Section Title	Training Hours	Avg. target number of questions per paper
1	Architecture and Architects	0.5	
2	Architecture and Precursors	2.5	5
3	Architecture Frameworks	2	1
4	Business Architecture	2	5
5	Data Architecture	2	4
6	Component Architecture	1	3
7	Applications Architecture	2	6
8	Design for NFRs	1	6
9	Infrastructure Architecture	2	4
10	Migration Planning	1	2
11	Architecture Management	2	4
	Total	18 hours	40

Format of Examination

Type	40 Questions Multiple Choice
Duration	1 Hour. An additional 15 minutes will be allowed for candidates sitting the examination in a language that is not their native /mother tongue.
Pre-requisites	Either the BCS Intermediate Certificate in Enterprise and Solution Architecture OR Studied the BCS Enterprise and Solution Architecture Syllabus and reference model, and have either the TOGAF 8 or TOGAF 9 level 2 Certificate. Recommended 6 years' experience of IS/IT work including some architecture definition and one of the following alternative qualifications
Supervised	Yes
Open Book	No
Pass Mark	26/40 (65%)
Calculators	Calculators cannot be used during this examination.
Learning Hours	18 Hours
Delivery	Paper based examination only

Trainer Criteria

Criteria	<ul style="list-style-type: none">▪ Hold the BCS Enterprise and Solution Architecture Practitioner Certificate with a minimum pass rate of 30/40 (75%)▪ Have a minimum of 2 years' training experience or 1 year with a recognised training qualification
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Classroom Size

Trainer to candidate ratio	1:16
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Recommended Reading List

Title [Enterprise Architecture as Strategy: Creating a Foundation for Business Execution](#)
Author Jeanne Ross, Peter Weill, & David C. Robertson
Publisher Harvard Business School Press
Publication August 2006
ISBN 978 15913 98394

Architectural styles and patterns:

Title [SOA in Practice: The Art of Distributed System Design](#)
Author Nicolai M. Josuttis
Publisher O'Reilly Media
Publication August 2007
ISBN 978 059 6529550

Title [Patterns for e-business](#)
Author Jonathan Adams
Publisher IBM Press
Publication October 2001
ISBN 978 19311 82027

Title [Design Patterns: Elements of Reusable Object Oriented Software](#)
Author Erich Gamma, Richard Helm, Ralph Johnson, & John Vlissides
Publisher Addison Wesley
Publication October 1994
ISBN 978-0201633610

Title [Patterns of Enterprise Application Architecture](#)
Author Martin Fowler
Publisher Addison Wesley
Publication November 2002
ISBN 978-0321127426

Relevant Standards

- [ISO/IEC 42010:2011](#) Systems and software engineering: Architecture description
- [ISO/IEC 24762:2008](#) Information technology. Security techniques. Guidelines for information and communications technology disaster recovery services
- [ISO/IEC 27001:2013](#) Information technology. Security techniques and Information security management systems. Requirements

- [ISO/IEC 20000-5:2013](#) Information Technology. Service Management. Exemplar implementation plan for ISO/IEC 20000-1(based on BS15000)
- [ISO9000:2014](#) Quality management systems. Fundamentals and Vocabulary

Relevant Websites

- [Architectural Styles and the Design of Network-based Software Architectures](#) by Roy Thomas Fielding
- [IBM patterns for e-business resources](#) (Red Books)
- Object Management Group (OMG) specifications and standards:
 - [Business Motivation Model](#)
 - [Business Process Modelling Notation](#) (BPMN)
 - [Unified Modeling Language Specification](#)
 - [Model Driven Architecture \(MDA\) Specification](#)
 - [Common Object Request Broker Architecture](#) (CORBA)
 - [IT Portfolio Management Facility \(ITPMF\) Specification](#)
- [Federal Enterprise Architecture Framework \(FEAF\)](#)
- [Practical Guide to Federal Enterprise Architecture](#)
- [The Open Group Architecture Framework \(TOGAF\)](#)
- [The Zachman Institute for Framework Advancement \(ZIFA\)](#)

Governance and principles:

- [OECD Principles of Corporate Governance, Organisation for Economic Co-Operation and Development](#)
- [Control Objectives for Information and Related Technology \(COBIT\)](#)
- [The Information Technology Governance Institute](#)