Understanding Data in Your Organisation V1.0

Syllabus

BCS Foundation Award

The Chartered Institute for IT

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

Document Change History

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

Version Number	Changes Made
1.0	Document creation.
1.1	Updated information on module credits.
1.2	Updated guidance for LO 5.1.

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Introduction

The BCS Foundation Award in Understanding Data in your Organisation is designed for those wishing to gain an understanding of the terminology, principles, concepts and approaches used within data management, and the overall value of data to an organisation.

As data becomes an important currency in the world and an enabler for the future, it is imperative that all organisations have a firm understanding of the data available to them and the power it can hold. This award takes a look at different types of data, the data lifecycle, the principles of data architecture and the importance of data quality and security. It also provides an introduction to the role of data analysis, and will act as a good starting point for those wishing to develop their knowledge and understanding of the principles of data to consider its use within AI and Machine Learning.

Qualification Suitability and Overview

There are no specific entry requirements for this award. However, some professional experience in a business or IT environment may be advantageous.

The BCS Foundation Award in Understanding Data in Your Organisation has been designed for individuals interested in furthering their understanding of the role of data within an organisation. Candidates may be working in a data role or in other areas of business where data is starting to become more prevalent in their day-to-day activities, for example, marketing, accounts, or customer service.
This award has been created alongside a selection of other awards available from BCS which offer candidates a clear pathway of progression into other disciplines of IT along with a broader knowledge of AI in the workplace. This makes it ideally suited for those looking for a change in career, an upskilling workforce, and sustainable employers.

This award counts towards achieving your Foundation Certificate in AI and/or your Foundation Diploma in AI.

- To receive the Foundation Certificate in AI, you need to achieve four awards - one award from each of the categories listed here (https://www.bcs.org/media/qd5dotas/ai-pathway-24.png)
- To receive the Foundation Diploma in AI, you need to achieve eight awards in total - one or more award from each of the categories listed here (https://www.bcs.org/media/qd5dotas/ai-pathway-24.png)

Once you have achieved this, please contact your training provider or, if you are a self-study candidate, BCS. Your certificate will then be processed.

Candidates can study for this award by attending a training course provided by a BCS accredited Training Provider or through self -study.

Total Qualification Time	Guided Learning Hours	Independent Learning	Assessment Qualification Time
50 hours	16 hours	33.5 hours	0.5 hours

*Examples of Independent Learning include reading of articles or books, watching videos, attendance of other types of training or work shadowing.

Trainer Criteria

It is recommended that to effectively deliver this award, trainers should possess:

- BCS Foundation Certificate in a relevant subject e.g. Data, Business Analysis, Artificial Intelligence.
- A minimum of 2 years' training experience or a recognised training qualification.

SFIA Levels

This award provides candidates with the level of knowledge highlighted within the table, enabling candidates to develop the skills to operate successfully at the levels of responsibility indicated.

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**

SFIA Plus

This syllabus has been linked to the SFIA knowledge skills and behaviours required of an individual working at level 3;

KSC10

The application of automated (software) tools which enable selective access to information, or extraction of patterns and knowledge from large amount of data, typically held within some form of database or "data warehouse". Also referred to as "Data Mining".

KSC19

Applying specific quality standards to all tasks undertaken to ensure that deliverables are accurate and complete.

KSB04

Identifying gaps in the available information required to understand a problem or situation and devising a means of resolving them.

KSCA5

The ability to harvest, clean, curate, manage, process and manipulate data in a variety of formats.

KSC51

The discipline associated with data sets so large and/or complex that traditional data processing applications are inadequate. The data files may include structured, unstructured and/or semi-structured data, such as unstructured text, audio, video, etc. Challenges include analysis, capture, curation, search, sharing, storage, transfer, manipulation, analysis, visualization and information privacy.

Learning Outcomes

Upon completion of the award, candidates will be able to demonstrate:

1. An understanding of the different types of Data
2. An understanding of The Data Lifecycle
3. An understanding of the differences between Structured and Unstructured Data
4. An basic understanding of the Data Architecture
5. An understanding of the role of Data Analysis
6. An understanding of the importance of Data Quality and Compliance

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1. Types of Data and the Data Lifecycle 20%) (K1/2)

Candidates will be able to:

1.1 Describe the differences between data, information, and knowledge.

Indicative content

a. Data' is raw or unorganised facts.
b. 'Information' is processed data to make it useful.
c. 'Knowledge' is understanding of information.

Guidance

What is data? Learners should be able to gain a clear understanding of the difference between data, information and knowledge. Introduce the function of Data Analysis in processing raw data into information, to enable a business to gain knowledge and insight in order to make business decisions.

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1. Types of Data and the Data Lifecycle 20%) (K1/2)

Candidates will be able to:

1.2 Understand and describe how to classify different types of data.

Indicative content

a. Structured and unstructured data.
b. Quantitative data.
   - Categorical (Discrete)
   - Continuous (Time-series)
c. Qualitative data.
   - Nominal
   - Ordinal

Guidance

It is important to recognise that not all data is created the same. There are different types of data and different ways to classify them based on how they are created and their format. Learners should be encouraged to consider how different types of data will need to be managed differently and can serve a different purpose.

Candidates will be able to:

1.3 Explain each of the stages of the Data Lifecycle.

Indicative content

a. Stages of a typical data lifecycle include:
   - Create
   - Store
   - Use
   - Archive
   - Delete

Guidance

Examine the concept that all data within a business will follow a lifecycle from the moment it is created to its eventual deletion. This concept helps to understand the processes and systems around how we manage and use data.

It is important to understand that this is one version of the data lifecycle. There are other versions of the data lifecycle which include additional stages such as 'Share'.

2. Structured and Unstructured Data (10%) (K1/2)

Candidates will be able to:

2.1 Understand and describe the differences between Structured, Semi-structured and Unstructured data..

Indicative content

a. Structured data
b. Semi-structured data
c. Unstructured data
d. Benefits and limitations of each type of data

Guidance

Learners should be able to become familiar with the characteristics of structured and unstructured data.

- Structured: Data files organised sequentially or organised serially in a tabular format.
- Semi-structured: Data that does not follow the tabular structure of a relational database but that does have some defining or organisational properties that allow it to be analysed.
- Unstructured: Data that does not follow any pre-defined order or structure.

Candidates will be able to:

2.2 Describe common sources of Structured data.

Indicative content

a. Relational Databases (SQL)
b. Database Management Systems
c. CSV files

Guidance

Explore how structured data is typically managed within a database or spreadsheet format where data is ordered using columns, rows, fields.

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2. Structured and Unstructured Data (10%) (K1/2)

Candidates will be able to:

2.3 Explain that Unstructured data can take various formats, listing examples.

Indicative content

a. Formats of unstructured data
   - Images
   - Audio
   - Video
   - Sensor and log data;
   - External data (such as social media feeds);
   - Word processed, spreadsheet and PowerPoint files;
   - Paper-based documents.

Guidance

Examine typical examples of unstructured data that can be generated by different devices and applications (e.g. cloud technologies, smartphones, mobile apps, social media, or through non-digital data collection methods)

It is important for learners to recognise that approximately 80% of today's data is unstructured.

Candidates will be able to:

2.4 Explain how both Structured and Unstructured data can provide greater insight to enable business decision making.

Indicative content

a. Different data combined into a common model to provide a broader range of information (formal, informal)
b. Agile decision making through the collection and analysis of real time data.
c. Greater understanding of the market
d. Big Data analysis
e. Business intelligence

Guidance

Discuss the need for/the benefits of analysing different types of data to enhance a business's awareness and understanding of its internal and external environment. Examine the concept of Big Data and the need to manage data from multiple sources that sit outside of a structured format. Business Intelligence tools such as Power BI are commonly being used by businesses for data visualisation to share, report, and make better use of data.

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3. Data Architecture (30%) (K1/2)

Candidates will be able to:

3.1 Explain what Data Architecture is and its purpose.

Indicative content	Guidance
a. Data architecture and how it supports: • An organisational approach to managing data (policies, procedures, systems)	Data Architecture typically comprises of Rules, Policies, Standards, and Models that govern how data is collected and stored by a business. Learners should be able to contextualise Data Architecture in relation to their own environment through the evaluation of examples.

Candidates will be able to:

3.2 Describe why a business needs to map its data to its infrastructure, applications, and business functions.

Indicative content	Guidance
a. Configuration of IT Systems/ digital ecosystem b. Operational processes and tasks c. Defined roles and responsibilities for managing different data d. Data flows between systems e. Use of APIs	Explore how the use of Data Architecture and a clear data strategy can ensure: • Relevant data is provided to each stakeholder group • More useful data that can inform on business decision, monitoring and reporting • Reduction in the duplication of data • One true source of data can be achieved • Data standardisation e.g. standard naming conventions are used • Better management of data and better data security • Develop data flows between systems, functions, and users • Development and utilisation of APIs that can improve efficiency and automate data flows • Better integration between systems (internal and external)

Candidates will be able to:

3.3 List and describe common data structures and how they are used to manage information.

Indicative content

a. Files;
b. Lists;
c. Arrays;
d. Records;
e. Trees;
f. Tables.

Guidance

Data structure refers to different ways of describing different types of information. It is useful for the learner to understand how different data can be managed and structured within different systems.

Candidates will be able to:

3.4 State the functions of Data Architecture.

Indicative content

a. Data migration
b. Data modelling
c. Data integration
d. Data warehousing
e. Database design

Guidance

The learner should have a basic understanding of these functions and how they contribute towards data management. They will not necessarily need to gain in-depth knowledge on these subjects. Learners may be directed to consider the Data Science Lifecycle if they wish to gain a deeper understanding of these functions and how they can support the implementation of an AI solution/use of Machine Learning.

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4. Data Analysis (20%) (K1/2)

Candidates will be able to:

4.1 Explain the role of Data Analysis in delivering insight to a business.

Indicative content	Guidance
a. Data Analysis b. Data Analyst role/ responsibilities	Learners should recognise the role of Data Analysis in supporting a business to make strategic decisions based on data.

Candidates will be able to:

4.2 State the functions of Data Analysis.

Indicative content	Guidance
a. Definition of business requirements for data analysis b. Data collection c. Data cleaning and preparation d. Data selection e. Data exploration f. Data modelling and testing g. Data visualisation h. Implementation of data model and maintenance	It is useful to provide an overview of these functions to emphasise how raw data can be transformed into information -and therefore knowledge – enabling insight. Leaners should have a basic understanding of these functions but not necessarily an in-depth understanding of how each function is carried out or the tasks required.

5. Data quality and compliance (20%) (K1/2)

Candidates will be able to:

5.1 Understand the importance and necessity of good quality data in respect to:

5.1.1 Legal and regulatory compliance.
5.1.2 Commercial and intellectual property.
5.1.3 Confidentiality, integrity, and availability.

Indicative content

a. What is good quality data?
b. The quality processes that define and govern good quality data.
c. Role and responsibilities for quality management.

Guidance

Learners should recognise the importance of data quality management to ensure legal compliance and in supporting a business to make strategic decisions based on data.

Candidates will be able to:

5.2 Identify the common sources of data errors and how to avoid and/or resolve them.

Indicative content

a. Sources of common errors include
   - Completeness
   - Uniqueness
   - Timeliness
   - Accuracy
   - Consistency

Guidance

It is useful for learners to explore these sources of error in relation to specific examples and consider methods for avoiding or fixing the error.

Data errors are often created where there is a requirement for data to be manually input into a system, however they can also arise where a machine is required to scan or interpret unstructured data (e.g. image)

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5. Data quality and compliance (20%) (K1/2)

Candidates will be able to:

5.3 Explain how minor data errors can create major issues.

Indicative content	Guidance
a. Major issues include: • Cost • Accuracy • Inconsistency • Cleanliness	It is important for the learner to understand that even small data errors can have more significant implications for a business or an individual, and in what ways.

Candidates will be able to:

5.4 Understand the benefit of having clearly defined data quality processes to the value of Data Analysis.

Indicative content	Guidance
a. Quality processes/practice b. Standard naming conventions c. Data audits	Quality processes can enable: • A reduction in errors. • More accurate data. • Better data selection/reduction in less useful data. • Better data security. • Improved business decision making as a result of better-quality data. • Greater potential for machine learning. Learners could be encouraged to consider the consequences of having no quality processes in place.

Candidates will be able to:

5.5 Describe the data protection and privacy issues associated with data management.

Indicative content

a. Discuss the types, formats and activities that are protected:
   - Personally Identifiable Information
   - Protected Health Information

Guidance

Learners should be encouraged to consider the sensitivity of different types of data that may be collected and stored by an organisation.

Candidates will be able to:

5.6 Recall and describe the key principles of the General Data Protection Regulation

Indicative content

a. Data Protection law
b. Why GDPR was introduced
c. An individual's right to be forgotten
d. Requirements for collecting, storing, managing, usingand disposing of data

Guidance

The General Data Protection Regulation was introduced in the EU in May 2018 to address the privacy concerns surrounding how businesses can handle customer information.

Learners should understand of the main principles of this regulation and how it influences the way in which a business can collect and use data.

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5. Data quality and compliance (20%) (K1/2)

Candidates will be able to:

5.7 Explain the need to comply with the General Data Protection Regulation.

Indicative content

a. Implications of non-compliance for an individual or business

Guidance

While learners are not expected to be able to memorise the entire content of the GDPR regulation, they should understand its key principles. They should understand the rules surrounding how data can be used by a business, and the legal and ethical responsibilities they have as an IT professional in following this regulation.

Examination Format

This award is assessed through completion of an invigilated online exam which candidates will only be able to access at the date and time they are registered to attend.

Type	18 Multiple Choice questions, 1 Scenario based question
Duration	30 minutes
Supervised	Yes
Open Book	No (no materials can be taken into the examination room)
Passmark	13/20 (65%)
Delivery	Digital format only.

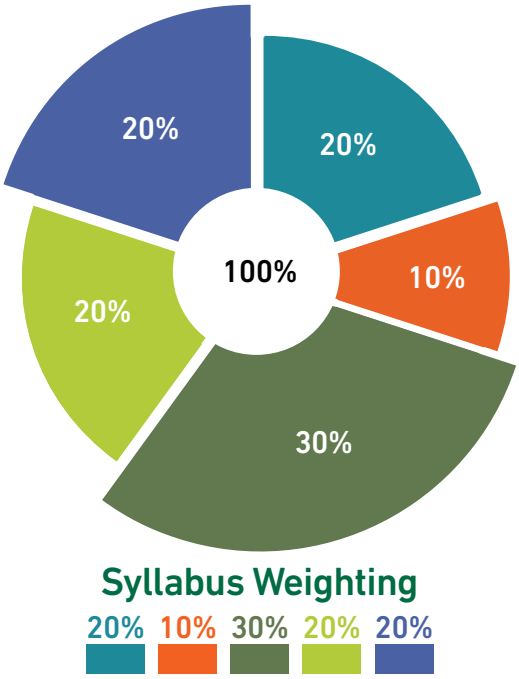
Adjustments and/or additional time can be requested in line with the BCS reasonable adjustments policy for candidates with a disability, or other special considerations including English as a second language.

Question Weighting

Each major subject heading in this syllabus is assigned a percentage weighting. The purpose of this is:

1. Guidance on the proportion of content allocated to each topic area of an accredited course.
2. Guidance on the proportion of questions in the exam.

Syllabus Area	Question type	
1. Types of Data and The Data Lifecycle	Multiple Choice	**20%**
2. Structured and Unstructured Data	Multiple Choice	**10%**
3. Data Architecture	Scenario Based Multiple Choice	**30%**
4. Data Analysis	Multiple Choice	**20%**
5. Data Quality and Compliance	Multiple Choice	**20%**



Recommended Reading

The following titles are suggested reading for anyone undertaking this award. Candidates should be encouraged to explore other available sources.

Title:	Managing Data Quality: A Practical Guide
Author:	Tin Ming, Julian Schwarzenbach
Publisher:	BCS
Publication Date:	4th May 2020
ISBN:	ISBN-13: 9781780174594

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CONTACT

For any queries relating to this document or the delivery of this award, please contact;

T: 01793 417445

E: bcssales@bcs.uk

If you have any queries relating to the online assessments, please contact;
Service Delivery - eprofessional@bcs.uk

For further information please contact:

BCS
The Chartered Institute for IT
3 Newbridge Square
Swindon
SN1 1BY

T +44 (0)1793 417 445

www.bcs.org

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