Data Visualisation

BCS Foundation Award

September 2020 v1.0

bcs
The Chartered Institute for IT

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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, date of the amendment and changes made. The purpose is to identify quickly what changes have been made.

Version Number	Changes Made
V1.0	Document Creation

The Chartered Institute for IT

Introduction

The BCS Foundation Award in Data Visualisation is designed for anyone wishing to gain an understanding of how data is used to make decisions in an organisation and the importance of presenting accurate data in a way that enables decision making to happen. It includes the principles of data driven decision making, and the tools that can be employed in data storage, analysis and presentation.

This award will enable candidates to understand these concepts at a Foundation Level, incorporating processes, frameworks and techniques used. It also looks towards the future use of data and how AI can present data in different ways to help organisations better understand their data.

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.

This Foundation Award is ideal for candidates who are looking to move into analytical or research roles or for people who want to understand more about the data they are using in their own role and how to present this.

This award has been created alongside a selection of other awards in the AI space 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, sustainable employers and individuals with a background in science, engineering, knowledge engineering, finance, education or IT services.

This list is not exhaustive, and many other roles may benefit.

This award represents 3 credits that can count towards the credits required for a BCS Foundation Certificate or Diploma in a relevant discipline.

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	Credits
30 hours	8 hours	21.5 hours	0.5 hours	3

*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 Artificial Intelligence or a similar qualification.
- 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 at level 3;

KSB21

Communicating effectively in writing, such as reports and via emails.

KSB12

Methods and techniques for delivering effective and accessible presentations, either face-to-face or online within various contexts and to a variety of audiences.

KSB20

Communicating effectively using the spoken word.

KSCA4

The ability to visualise and present information and data in an appropriate format that helps stakeholders understand the significance of the information and data.

KSD25

Methods and techniques for writing clear, accessible and persuasive business and technical reports.

Further detail around the SFIA Levels can be found at www.bcs.org/levels.

Learning Outcomes

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

1. Data driven decision making
2. Data storing and analysis tools
3. Data presentation tools and techniques
4. Human and machine learning together

Syllabus

1. Data driven decision making (30%) (K1/2)

Candidates will be able to:

1.1 Outline the uses of data within an organisation..

Indicative content	Guidance
a. Business analytics b. Business intelligence	Introduce candidates to the use of data to provide insight into business performance and to assist with decision making – basing decisions on the facts presented by data, rather than opinion or personal experience. Highlight the differences between business analytics (BA) - concerned with predicting trends and future patterns, and business intelligence (BI) concerned with current or past data..

Syllabus

1. Data driven decision making (30%) (K1/2)

Candidates will be able to:

1.2 Recognise the process of formatting data to make decisions.

Indicative content	Guidance
a. Data selection b. Formatting c. Cleaning d. Presenting data	Explore the need for data to be formatted in a way which is meaningful to decision makers and the subject matter, but firstly to be able to be analysed correctly. Data in the wrong format can become meaningless or disruptive..

Candidates will be able to:

1.3 Identify issues with using data to make decisions.

Indicative content	Guidance
a. Engaging stakeholder - buy-in and ownership b. UX and CX	Candidates should be encouraged to consider the need to engage stakeholders when using data to make decisions – ensuring they understand the data being presented and the approach being taken. Similarly, user and customer experience must also be considered – for example, does the data suggest or present challenges with usability or customer interaction.

2. Data storing and analysis tools (20%) (K1/2)

Candidates will be able to:

2.1 Explain how to store data.
2.2 Describe the requirements regarding data protection.
2.3 Illustrate the process of using technology to analyse data.

Indicative content	Guidance
a. Databases b. Cloud technology c. Securing data, permissions d. Tools e.g. R Programming, Python, Tableau	Explore the legal and organisational requirements for the storage of data, including data protection legislation (consider the principles, rights on data subjects and roles and responsibilities of organisations and individual post-holders). Different types of data will have different storage requirements, depending on data type, security/ access requirements etc. Consider examples of tools which can be used to analyse and visualise data, such as R Programming or Tableau (link to LO 1.2)

Syllabus

3. Data presentation tools and techniques (30%) (K1)

Candidates will be able to:

3.1 Classify the tools and techniques used to present data, considering the following formats:

- **3.1.1** Written form
- **3.1.2** Verbal form
- **3.1.3** Pictorial form
- **3.1.4** Sounds form
- **3.1.5** Dashboards and infographics
- **3.1.6** Virtual reality and Augmented reality
- **3.1.7** Sounds

Indicative content

a. Tools e.g. spreadsheets, presentation software
b. Visualisation tools such as PowerBI for reporting dashboards.

Guidance

Invite candidates to explore the different presentation requirements/expectation of different parties, and therefore, the need for different presentation tools and techniques to accommodate this and the different data types they may need to present. For example, presentation software may be suitable to provide a high level overview of some data, whereas tools such as Power BI can provide an additional level of detail.

4. Human and machine learning together. The learning environment (20%) (K1)

Candidates will be able to:

4.1 Recognise the following learning environment examples where both humans and machines would be required to learn in conjunction:

- **4.1.1** Virtual reality/Augmented reality e.g. Flight simulators
- **4.1.2** Ergonomics e.g. Designing an operation interface for a surgeon
- **4.1.3** Digital twin e.g. Ocado, online supermarket
- **4.1.4** Immersive environment (the audience of the future)

Indicative content

a. The use of VR and Augmented reality
b. Ergonimics
c. Digital twins

Guidance

Explore the idea of AI and humans both learning at the same time. Consider the VR example, when both the AI technology and the human user become more “intelligent” with each use – changing their behaviour to achieve a better outcome..

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	16 Multiple Choice questions, 2 Scenario Based Questions
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.

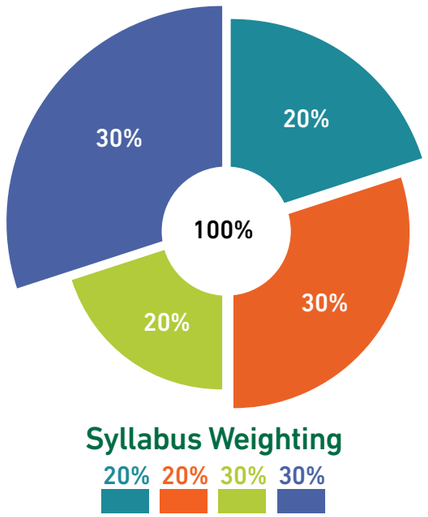
Adjustments and/or additional time can be requested in line with the BCS reasonable adjustments policy for candidates with a disability, or other special considerations including English as a second language.

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. Data driven decision making	Multiple Choice	**20%**
2. Data storing and analysis tools	Scenario Based Multiple Choice	**30%**
3. Data presentation tools and techniques	Multiple Choice	**20%**
4. Human and machine learning together. The learning	Scenario Based Multiple Choice	**30%**



Recommended Reading

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

Title:	Data Analyst
Author:	Harish Gulati, Charles Joseph, Rune Rasmussen, Clare Stanier, Obi Umegbolu
Edited By:	Rune Rasmussen
Publisher:	BCS
Publication Date:	March 2019
ISBN:	9781780174327

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