Qualification Specification

NCFE Level 4 Diploma: Data Analyst

QN: 603/7751/3

Qualification summary

Qualification title	**NCFE Level 4 Diploma: Data Analyst**		
Ofqual qualification number (QN)	603/7751/3	**Aim reference**	60377513
Guided learning hours (GLH)	510	**Total qualification time (TQT)**	1200
Credit value	120		
Minimum age	18		
Qualification purpose	This qualification is designed to give learners the knowledge and associated skills and behaviours required to work in a variety of roles in data analysis. It will also prepare learners to progress to further study and apprenticeships in this area. This qualification is designed for learners who want to upskill or retrain within the digital sector. It is also suitable for learners who want to further their studies in the digital sector. This higher technical qualification (HTQ) will give learners the skills, knowledge and behaviours to meet specific employer needs and industry requirements.		
Grading	Pass/merit/distinction		
Assessment method	Internally assessed and externally quality assured portfolio of evidence, including task-based controlled assessments.		
Work/industry placement experience	Work/industry placement experience is not required.		
Apprenticeship standards	This HTQ content has been aligned with the Data Analyst apprenticeship standard. This HTQ is designed to be delivered as a stand-alone qualification which is an alternative to an apprenticeship. It does not form part of an apprenticeship.		
Regulation information	This is a regulated qualification. The regulated number for this qualification is 603/7751/3.		
Funding	This qualification may be eligible for funding. For further guidance on funding, please contact your local funding provider.		

Contents

Section 1: introduction

Please note this is a draft version of the Qualification Specification and is likely to be subject to change before the final version is produced for the launch of the qualification.

If you are using this Qualification Specification for planning purposes, please make sure that you are using the most recent version.

A higher technical qualification (HTQ) is a prestigious, kite-marked qualification aimed at meeting employers' needs and increasing learner engagement in level 4 or 5 technical education. This HTQ content has been aligned with the Data Analyst apprenticeship standard.

This qualification aims to:

- provide the knowledge, skills and behaviours that are needed to enter occupations across the country
- be understood and recognised as high-quality by employers and so have national labour market currency
- give learners confidence that those qualifications are recognised by employers and are perceived to be a credible, prestigious, and distinct pathway

Aims and objectives

This qualification aims to:

- focus on the study of data analysis within the digital sector
- offer breadth and depth of study, incorporating a key core of knowledge
- provide opportunities to acquire a number of practical and technical skills

The objectives of this qualification are to provide learners with knowledge, skills and behaviours related to the following areas:

- legislation and security standards applied to data analytics
- data fundamentals and lifecycle
- data structure and databases
- stakeholder engagement and user experience in data analytics
- organisational data
- data mining and statistical analysis

Support Handbook

This Qualification Specification must be used alongside the mandatory Support Handbook, which can be found on the NCFE website. This contains additional supporting information to help with planning, delivery and assessment.

This Qualification Specification contains all the qualification-specific information you will need that is not covered in the Support Handbook.

Guidance for entry and registration

This qualification is designed for learners who want to begin or advance their career within data analysis. It is also suitable for learners who wish to progress to further study in this specialised area.

Registration is at the discretion of the centre in accordance with equality legislation and should be made on the Portal.

There are no specific prior skills/knowledge a learner must have for this qualification. However, learners may find it helpful if they have already achieved a relevant level 3 qualification.

Centres are responsible for ensuring that all learners are capable of achieving the learning outcomes (LOs) and complying with the relevant literacy, numeracy and health and safety requirements.

Learners registered on this qualification should not undertake another qualification at the same level, or with the same/a similar title, as duplication of learning may affect funding eligibility.

Achieving this qualification

To be awarded this qualification, learners must achieve 120 credits at a minimum of a pass in each of the 6 mandatory units.

Please refer to the list of units in appendix A or the unit summaries in section 2 for further information.

To achieve this qualification, learners must successfully demonstrate the achievement of all LOs of the units as detailed in this Qualification Specification. A partial certificate may be requested for learners who do not achieve their full qualification but have achieved at least one whole unit, partial certificate fees can be found in the Fees and Pricing document on the NCFE website.

Progression including job roles (where applicable)

Learners who achieve this qualification could progress to the following:

- employment:
  - junior analyst
  - data analyst
  - departmental data analyst
  - energy data analyst
  - marketing data analyst
  - problem analyst
- further education:
  - related apprenticeships
- higher education

Resource requirements

There are no mandatory resource requirements for this qualification, but centres must ensure learners have access to suitable resources to enable them to cover all the appropriate LOs.

Real work environment (RWE) recommendation

Where the assessment strategy for a qualification allows, it is essential that organisations wishing to operate a RWE do so in an environment that reflects a real work setting and replicates the key characteristics of the workplace in which the skill to be assessed is normally employed. This is often used to support simulation. Use of a RWE is not mandatory for this qualification.

How the qualification is assessed

Assessment is the process of measuring a learner's skill, knowledge and understanding against the standards set in a qualification.

This qualification is internally assessed and externally quality assured.

The assessment consists of one component:

- an internally assessed portfolio of evidence, which is assessed by centre staff and externally quality assured by NCFE (internal quality assurance must still be completed by the centre as usual)

Learners must be successful in this component to gain the Level 4 Diploma: Data Analyst.

Learners who are not successful can resubmit work within the registration period; however, a charge may apply in cases where additional external quality assurance visits are required.

All the evidence generated by the learner will be assessed against the standards expected of a level 4 learner for each learning outcome (LO).

Unless otherwise stated in this specification, all learners taking this qualification must be assessed in English and all assessment evidence presented for external quality assurance must be in English.

Internal assessment

We have created some sample tasks for the internally assessed units. These tasks are not mandatory. You can contextualise these tasks to suit the needs of your learners to help them build up their portfolio of evidence. The tasks have been designed to cover some LOs and provide opportunities for stretch and challenge. For further information about contextualising the tasks, please contact the Provider Development team.

Each learner must create a portfolio of evidence generated from appropriate assessment tasks to demonstrate achievement of all the LOs associated with each unit. The assessment tasks should allow the learner to respond to a real-life situation that they may face when in employment. On completion of each unit, learners must declare that the work produced is their own and the assessor must countersign this.

If a centre needs to create their own internal assessment tasks, there are four essential elements in the production of successful centre-based assessment tasks; these are:

- ensuring the assessment tasks are meaningful with clear, assessable outcomes
- appropriate coverage of the content, LOs, or grading criteria
- having a valid and engaging context or scenario

- including sufficient opportunities for stretch and challenge for higher attainers

External quality assurance

Summatively assessed and internally quality assured grades for completed units must be submitted via the Portal, prior to an external quality assurance review taking place. Following the external quality assurance review, the unit grades will either be accepted and banked by your external quality assurer (EQA) or, if they disagree with the grades, they will be rejected. More detailed guidance on this process and what to do if your grades are rejected can be found in the Support Handbook and on the NCFE website.

Enquiries about results

All enquiries relating to learners' results must be submitted in line with our Enquiries about Results and Assessment Decisions Policy, which is available on the NCFE website.

Not yet achieved grade

A result that does not achieve a pass grade will be graded as a not yet achieved grade. Learners may have the opportunity to resit.

Grading information

Each unit of the qualification is graded using a structure of not yet achieved, pass, merit or distinction.

Grading internally assessed units

The grading criteria for each unit have been included in the Qualification Specification. Grading criteria have been written for each LO in a unit. Assessors must be confident that, as a minimum, all LOs have been evidenced and met by the learner. Assessors must make a judgement on the evidence produced by the learner to determine the grading decision for the unit. NCFE has provided a grading criteria explanation of terms in the Qualification Specification to help you to make this judgement.

Once assessors are confident that all the pass descriptors have been met, they can move on to decide if the merit descriptors have been met. If the assessor is confident that all the merit descriptors have been met, they can decide if the distinction descriptors have been met. As the grading criteria build up from the previous grade's criteria, the evidence must meet 100% of the grade's descriptors to be awarded that grade for the unit.

If the learner has insufficient evidence to meet the pass criteria, a grade of not yet achieved must be awarded for the unit.

Centres must then submit each unit grade via the Portal. The grades submitted will be checked and confirmed through the external quality assurance process. This is known as 'banking' units. Once a learner's grade has been banked, they are permitted one opportunity to revise and redraft their work; more detail on this process can be found in the Support Handbook.

All grading criteria needs to be evidenced in the learner's portfolio, but the grade awarded is based on the standard of work for the LO as a whole. This allows for increased professional judgement on the part of the assessor in terms of the learner's overall level of performance against the LOs.

Awarding the final grade

To achieve the qualification, learners must have achieved 120 credits at a minimum of a pass in each of the 6 mandatory units.

The calculation of the overall qualification grade is based on the learner's overall performance across all of the units. Learners are awarded their grade based on the points allocated for each grade, across all 120 credits. The table below shows the amount of points awarded for each credit, per unit.

Grade	Points per credit
Pass	1
Merit	3
Distinction	5

This means that if a learner gains a pass in a unit of 15 credits, they would receive 15 points.
If they then gained a merit in a unit of 15 credits, they would receive 45 points.
If they then gained distinction in their remaining units, totalling 90 credits, they would receive 450 points.
This would give a total of 510 points, which would then be used to calculate the overall grade, using the table below.

The table below shows the overall total points required for each of the grade boundaries:

Grade	Points boundaries
Not yet achieved	0 to 119
Pass	120 to 299
Merit	300 to 499
Distinction	500+

The final grade for the qualification is based on a structure of not yet achieved, pass, merit or distinction and will be issued to the centre by NCFE upon the centre claiming the learner's certificate on the Portal.

For further information on assessment, please refer to the User Guide to the External Quality Assurance Report.

NCFE does not anticipate any changes to our aggregation methods or any overall grade thresholds; however, there may be exceptional circumstances in which it is necessary to do so to secure the maintenance of standards over time. Therefore, overall grade thresholds published within this Qualification Specification may be subject to change

Records of grades achieved for the NCFE Level 4 Diploma: Data Analyst (603/7751/3)

Grades achieved			Distinction		Merit		Pass		Points/ grade
Unit number	**Unit title**	**Credits per unit**	**Points per credit**	**Points**	**Points per credit**	**Points**	**Points per credit**	**Points**	
A/651/0924	Legislation and security standards applied to data analytics	10	5	50	3	30	1	10	
D/651/0925	Data fundamentals and lifecycle	20	5	100	3	60	1	20	
F/651/0926	Data structure and databases	20	5	100	3	60	1	20	
H/651/0927	Stakeholder engagement and user experience in data analytics	20	5	100	3	60	1	20	
J/651/0928	Organisational data	20	5	100	3	60	1	20	
K/651/0929	Data mining and statistical analysis	30	5	150	3	90	1	30	
							Total points		

Section 2: unit content and grading criteria

This section provides details of the structure and content of this qualification.

Within learners' portfolios, other types of evidence are acceptable if all learning outcomes (LOs) are covered and if the evidence generated can be internally and externally quality assured. Centres can select suitable assessment methods. A range of assessment methods should be used to holistically assess a range of criteria where possible. Centres should use the requirements of the unit, and the grading criteria to determine suitable assessment methods that are relevant to the requirements of the industry. For approval of methods of internal assessment other than portfolio building, please contact your external quality assurer (EQA).

Sample assignment briefs and tasks have been created for some of the LOs within the units. These sample assignment briefs and tasks are not mandatory. Centres may adapt these briefs and/or tasks to suit the needs of their learners to help build up their evidence, or they can develop their own. The sample assignment briefs and tasks have been designed to demonstrate coverage of a selection of the knowledge and/or skills LOs and provide opportunities for stretch and challenge.

The explanation of terms explains how the terms used in the unit content are applied to this qualification. This can be found in section 3.

Behavioural framework

Embedded within higher technical qualifications (HTQs) is the opportunity for learners to develop behaviours relevant to their chosen discipline, in line with the qualification's knowledge and skills.

The following table identifies opportunities to demonstrate the behaviours – embedded within the knowledge and skills – that will be assessed as part of this HTQ. Learners may also naturally demonstrate these behaviours elsewhere, beyond the listing below. All listed behaviours are subject to assessment.

B1: maintain a productive, professional and secure working environment
B2: show initiative, being resourceful when faced with a problem and taking responsibility for solving problems within their own remit
B3: work independently and collaboratively
B4: logical and analytical
B5: identify issues quickly, investigating and solving complex problems and applying appropriate solutions. Ensures the true root cause of any problem is found and a solution is identified which prevents recurrence
B6: resilient – viewing obstacles as challenges and learning from failure
B7: adaptable to changing contexts within the scope of a project, direction of the organisation or Data Analyst role

	Behaviours						
Unit	B1	B2	B3	B4	B5	B6	B7
1: Legislation and security standards applied to data analytics	LO4	N/A	N/A	N/A	N/A	N/A	N/A
2: Data fundamentals and lifecycle	LO2, LO4	LO2	LO2, LO4	LO2, LO4	LO2, LO4	LO4	N/A
3: Data structure and databases	LO3	LO3	LO3	LO2, LO3	LO3	LO3	LO3
4: Stakeholder engagement and user experience in data analytics	LO2, LO3	N/A	LO2, LO3	LO2, LO3	LO2, LO3	LO2, LO3	LO2, LO3
5: Organisational data	LO1, LO3	LO1, LO3	LO1, LO3	LO1, LO3	LO1	LO1, LO3	LO3
6: Data mining and statistical analysis	LO1, LO3	LO1, LO3	LO3	LO1, LO3	N/A	LO3	LO3

Unit 01 Legislation and security standards applied to data analytics (A/651/0924)

Unit summary				
This unit emphasises the importance of exploring key features of relevant legislation, security standards and organisational policies and procedures to understand their influence on safe data usage and data management activities.				
Assessment				
Internally assessed unit				
Mandatory	**Graded P/M/D**	**Level 4**	**10 credits**	**30 GLH**

Learning outcomes (LOs)	Mandatory teaching content
1. Explore relevant legislation and their influence on the safe use of data	**Knowledge:** Relevant legislation: • UK General Data Protection Regulation (GDPR)/The Data Protection Act 2018 • Digital Economy Act 2017 • Computer Misuse Act 1990
2. Investigate the impact of relevant security standards, security frameworks and organisational policies and procedures on data management activities	**Knowledge:** Security standards and security frameworks: • Payment Card Industry Data Security Standard (PCI DSS) • International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) 27001 Organisational policies and procedures relevant to data management activities: • encryption policies • back-up and recovery procedures Data management activities: • governance • integration • analysis Principles of privacy by design: • privacy by default • proactive not reactive • end-to-end security

Learning outcomes (LOs)	Mandatory teaching content
3. Examine ethical data principles and the role of artificial intelligence (AI) in the collation and utilisation of data	**Knowledge:** Ethical data principles: • transparency • accountability • fairness • accuracy • privacy Ethical responsibilities within the role of data analytics The use of AI in the collation and utilisation of data: • reliability • accuracy • bias

4. Demonstrate effective use and compliance of data systems when securely collating and utilising data	**Skills:**
	
	Use of:
	
	• data systems:
	  ○ information system
	  ○ management system
	  ○ reporting system
	• compliance:
	  ○ legislation
	  ○ standards
	  ○ policies
	  ○ procedures
	• principles:
	  ○ privacy by design

Grading criteria

Learning outcomes (LOs)	Pass	Merit	Distinction
LO1: Explore relevant legislation and their influence on the safe use of data	**P1:** Describe the key features of relevant regulatory requirements in relation to the role of a data analyst	**M1:** Consider a range of relevant legislation and clearly explain the impact each of these have on both the organisation and the data analysts	**D1:** Critically evaluate the use of policies and procedures to ensure compliance with a wide range of legal requirements, security standards and security frameworks
	P2: Explain the importance of complying with legislation and the impact of non-compliance		
LO2: Investigate the impact of relevant security standards, security frameworks and organisational policies and procedures on data management activities	**P3:** Define relevant security standards and security frameworks related to data management activities	**M2:** Explore the impact of organisational policies and procedures within a security framework which supports compliance	**D2:** Assess the impact on data management and propose innovative solutions for any security gaps
	P4: Outline policies and procedures used by an organisation to ensure compliance with standards and frameworks		
LO3: Examine ethical data principles and the role of AI in the collation and utilisation of data	**P5:** Describe the value of applying ethical data principles when handling data	**M3:** Determine the effectiveness of applying ethical data principles and the consequences of not applying these principles	**D3:** Critically evaluate common ethical data principles to address the challenges and ethical considerations in the context of AI and data analysis, and elaborate on how common data principles can be applied
LO4: Demonstrate effective use and compliance of data systems when securely collating and utilising data	**P6:** Collect and use data for an analysis activity whilst adhering to legal and organisational	**M4:** Assess examples of how legal and organisational requirements have been met whilst undertaking a data analysis task	

Unit 02 Data fundamentals and lifecycle (D/651/0925)

Unit summary				
This unit delves into the foundational aspects of understanding, organising, and effectively utilising data within organisations.				
Assessment				
Internally assessed unit				
Mandatory	**Graded P/M/D**	**Level 4**	**20 credits**	**90 GLH**

Learning outcomes (LOs)	Mandatory teaching content
1. Explore the purpose of different data types and their use, characteristics, and applications	**Knowledge:** Qualitative and quantitative data types: • discrete (for example, integer) • continuous (for example, float) • text (for example, string) • geospatial (for example, co-ordinate pair) • logical (for example, Boolean) • temporal (for example, date and time) Different types of datasets: • open and public data • administrative data • research data Common linear and non-linear data structures: • lists • array • stack • heap
2. Perform analysis of datasets and relevant data structures	**Skills:** Interpret datasets, consisting of qualitative and quantitative data Use of relevant data structures Application of principles of data classification

Learning outcomes (LOs)	Mandatory teaching content
3. Examine the importance of data classification and considerations needed for data management	**Knowledge:** Types of data classification: • sensitivity • criticality Data management when working with data: • sharing • ownership • storage • quality • lineage Purpose of metadata: • identifying the source • recency • size • identifying data owners
4. Implement the fundamental principles of the data lifecycle	**Knowledge:** Stages of the data lifecycle when carrying out routine data analysis tasks: • data creation • data storage • data sharing and usage • data archival • data deletion The role and relationship between each stage of the data lifecycle in ensuring data integrity Requirements of each stage of the data lifecycle **Skills:** Application of the data lifecycle in relation to routine daily data analysis tasks

Grading criteria

Learning outcomes (LOs)	Pass	Merit	Distinction
LO1: Explore the purpose of different data types and their use, characteristics, and applications	**P1:** Describe the properties and uses of qualitative and quantitative data types	**M1:** Examine a range of dataset types and highlight their differences and use cases	**D1:** Critically evaluate data types and justify their significance
	P2: Explain the characteristics and application of common linear and non-linear data structures		
LO2: Perform analysis of datasets and relevant data structures	**P3:** Explore basic datasets and relevant data structures by applying fundamental techniques and principles	**M2:** Demonstrate an understanding of datasets and relevant data structures, and effectively apply analytical techniques to derive insights and make informed decisions	**D2:** Critically analyse datasets and data structures, employing advanced methods to extract valuable insights, and apply knowledge and creativity to solve complex problems
	P4: Describe relevant data structures and how to appropriately classify data		
LO3: Examine the importance of data classification and considerations needed for data management	**P5:** Summarise types of data classification methods and considerations for effective data management	**M3:** Discuss the importance of data classification within the context of data management practices	**D3:** Evaluate the different approaches to data classification and its significance in efficient data management. By analysing applications, organisational efficiency and privacy and security implications
	P6: Outline the purpose of metadata		
LO4: Implement the fundamental principles of the data lifecycle	**P7:** Identify the role and requirements for each stage of the data lifecycle and how this is applied to routine data tasks	**M4:** Explore the various stages of the data lifecycle, emphasising their collective role in safeguarding data integrity	
	P8: Carry out a routine daily data task following each stage of the data lifecycle	**M5:** Examine the effectiveness of the data lifecycle by applying it to a routine data task	

Unit 03 Data structure and databases (F/651/0926)

Unit summary				
This unit provides an in-depth exploration of the essential principles in database system design, implementation, and maintenance within the context of data analytics. This unit equips learners with the knowledge and skills to effectively manage data structures and databases to support the analytical needs of modern organisations.				
Assessment				
Internally assessed unit				
Mandatory	**Graded P/M/D**	**Level 4**	**20 credits**	**90 GLH**

Learning outcomes (LOs)	Mandatory teaching content
1. Examine the fundamentals of database system design	**Knowledge:** Features and common uses of types of database: • relational • non-relational The impact of the following factors on database system design: • scalability • security considerations • platform selection • data quantity • adaptability to change Phases of database development lifecycle How the data analysis lifecycle supports database system design
2. Explore the application of data modelling and database design and the implementation and maintenance of database systems and process	**Knowledge:** The process and purpose of data modelling Database design tools: • entity relationship diagram (ERD) • data flow diagram (DFD) The characteristics and uses of different data formats in relational and non-relational databases: • structured • unstructured • semi-structured

Learning outcomes (LOs)	Mandatory teaching content
	The process of database system implementation: • data migration • testing The importance of database system maintenance: • scheduled routine maintenance • regular data backups **Skills:** Use the data analysis lifecycle to: • define the data's purpose • create a DFD • identify how the design supports future analysis
3. Investigate common quality risks in data and implement mitigation techniques	**Knowledge:** Types of inconsistencies in data and the potential impacts on an organisation (for example, aged data, data types) Quality risks associated with using unclean data Risks involved when combining data from multiple sources Risk mitigation or resolution techniques: • validation of original data source • cleansing • model enhancement Key considerations when escalating data risks or identifying resolutions (for example, following policy and procedures, in a timely manner, through appropriate channels) and their importance **Skills:** Analyse and identify quality risks in data and potential causes, suggesting potential mitigations or resolutions as part of escalation

Grading criteria

Learning outcomes (LOs)	Pass	Merit	Distinction
LO1: Examine the fundamentals of database system design	**P1:** Describe the features and application of both relational and non-relational databases	**M1:** Determine how database fundamentals, design considerations, and the relationship between data analysis and database system design contribute to ensuring robust and efficient data management	**D1:** Compare and contrast relational and non-relational databases, justifying use cases for both by referencing design considerations
	P2: Explain the database development lifecycle		
LO2: Explore the application of data modelling and database design and the implementation and maintenance of database systems and process	**P3:** Explain the process and purpose of data modelling using suitable design tools	**M2:** Evaluate the importance of implementation processes and routine maintenance to ensure a well-functioning database system	**D2:** Assess data modelling techniques for conceptual, logical and physical designs and reflect on the design process
	P4: Describe the characteristics of different data formats within different types of databases and outline processes to implement and maintain databases		
	P5: Outline appropriate database designs to meet future analytical needs using the data analysis lifecycle	**M3:** Examine why aligning database designs with analytical goals facilitates efficient and meaningful future analyses	
LO3: Investigate common quality risks in data and implement mitigation techniques	**P6:** Explain various types of inconsistencies in data and outline the impact of using unclean data	**M4:** Explore examples of data quality risks and how to mitigate them	**D3:** Evaluate data inconsistencies and issues as well as their associated risks, and justify recommended mitigation techniques
	P7: Summarise the risks associated with combining data and state methods for escalating data risks		

Learning outcomes (LOs)	Pass	Merit	Distinction
	P8: Discuss the ability to identify data risks and explain how mitigation techniques can be used	**M5:** Apply mitigation techniques to known data quality issues	

Unit 04 Stakeholder engagement and user experience in data analytics (H/651/0927)

Unit summary				
This unit explores the critical aspects of optimising user experience and adopting effective stakeholder engagement within the realm of data analytics. This unit empowers learners to understand the factors that influence user experience and to adeptly define stakeholder requirements to ensure meaningful and impactful data analysis outcomes.				
Assessment				
Internally assessed unit				
Mandatory	**Graded P/M/D**	**Level 4**	**20 credits**	**90 GLH**

Learning outcomes (LOs)	Mandatory teaching content
1. Examine how to plan and deliver an effective analysis for a range of stakeholders	**Knowledge:** Identifying internal and external stakeholders Approaches to collecting stakeholder requirements (for example, interviews) The importance of identifying the scope of data analysis, including timescales, purpose, expected outcomes and the impact of scope creep The role and structure of use cases, user stories and scenarios in documenting user requirements Factors that could influence data analytic planning (for example, constraints and resource availability) The importance of identifying dataset needs and where these will be sourced including, internal and external data
2. Demonstrate how to collate and display data using the most appropriate visualisation tools and assess the impact on user experience	**Skills:** Use of visualisation tools: • infographics • reports • tables • dashboards • charts/graphs Assess the impact of the user experience on the data analysis activity

Learning outcomes (LOs)	Mandatory teaching content
3. Explore factors that can impact user experience in relation to data analytics	**Knowledge:** Accessibility measures that can be applied to improve end user experience (for example, colour, font, layout) The application of usability theories to improve end-user experience: • Fitts' Law • Miller's Law • Nielsen's Usability Heuristics How end-user requirements influence the way that data is presented The potential impacts of not meeting end-user requirements when presenting data **Skills:** Undertake analysis based on stakeholder requirements Implement findings of data analytics into planning and document outputs Collaborate and communicate with stakeholders to understand requirements, taking into account: • stakeholder type (for example, internal, external) • appropriate styles and behaviours • utilisation of technology

Grading criteria

Learning outcomes (LOs)	Pass	Merit	Distinction
LO1: Examine how to plan and deliver an effective analysis for a range of stakeholders	**P1:** Identify internal and external stakeholders and list techniques used to gather user requirements	**M1:** Discuss the role and structure of user requirement documenting methods within the data analytic planning process	**D1:** Evaluate internal and external stakeholder needs in each stage of a data analysis and the impact of not adhering to these needs
	P2: Describe factors that could influence data analytic planning and outline the significance of defining the scope of data analysis		

Learning outcomes (LOs)	Pass	Merit	Distinction
	P3: Explain the importance of identifying dataset needs and how these will be sourced		
	P4: Demonstrate the ability to undertake analysis based on stakeholder requirements and clearly communicate findings	**M2:** Simplify the insights of an analysis and effectively communicate findings to stakeholders	
LO2: Demonstrate how to collate and display data using the most appropriate visualisation tools and assess the impact on user experience	**P5:** Collect and present data using the most appropriate visualisation tool	**M3:** Demonstrate how amending user requirements shape data approaches, stating the impact of not meeting these requirements and demonstrate the ability to use visualisation tools strategically and determine their impact on the user experience	**D2:** Analyse how amending user requirements shape data presentation approaches, whilst evaluating the significant impact of not meeting user requirements on data presentations. Demonstrating proficiency in using visualisation tools on the user experience
	P6: Describe how a visualisation impacts user experience		
	P7: Explain how end-user requirements shape data presentation approaches and state the impact of not meeting these requirements		
LO3: Explore factors that can impact user experience in relation to data analytics	**P8:** Explore a range of accessibility measures and usability theories and describe how these can be applied to improve the user experience	**M4:** Examine the role of user experience in data analytics and discuss the techniques required to produce effective data visualisations	**D3:** Assess how accessibility measures can be utilised in a variety of ways and evaluate how they can vary in their impact regarding individual needs

Unit 05 Organisational data (J/651/0928)

Unit summary				
This unit provides a detailed exploration of data analytics within an organisational context. It focuses on approaches to data combination for matching and comparing data, data architecture, and the tools used in data analytics.				
Assessment				
Internally assessed unit				
Mandatory	**Graded P/M/D**	**Level 4**	**20 credits**	**90 GLH**

Learning outcomes (LOs)	Mandatory teaching content
1. Explore common data combination techniques and identify data sources	**Knowledge:** The purpose and use of common techniques for matching and comparing data: • exact matching • fuzzy matching • data profiling • data standardisation • record linkage **Skills:** Identify appropriate data sources for analysis activity Identify risks and challenges to data combination
2. Examine common data analytics methods and the functions and features of the tools used to support this	**Knowledge:** The application of common methods used within data analytics: • data mining • predictive analytics, including time series forecasting Functions and features of common data analytic tools: • programming languages (for example, Python, structured query language (SQL)) • spreadsheet tools (for example, pivot tables, dashboard) • vendor-specific software How factors influence the selection of tools and methods for data analysis, including: • structure of data • size of dataset

Learning outcomes (LOs)	Mandatory teaching content
	• complexity • reporting objective
3. Investigate organisational data architecture and demonstrate how to design data models	**Knowledge:** The role and purpose of organisational data architecture in managing data (for example, data collection) The application of data models to support the visual representation of organisational data flow including: • conceptual • logical • physical The characteristics of storage repositories and their suitability to meet organisational requirements: • data warehouse • data mart • data lake **Skills:** Create a logical data model to meet organisational requirements

Grading criteria

Learning outcomes (LOs)	Pass	Merit	Distinction
LO1: Explore common data combination techniques and identify data sources	**P1:** Describe the purpose and outline the application of common techniques for matching and comparing data	**M1:** Examine a range of common techniques for matching and comparing data	**D1:** Evaluate the use of various techniques used when matching, comparing and combining data and elaborate on any risks associated with this
	P2: Identify appropriate data sources for combining data	**M2:** Explore the ability to combine data from multiple sources and explain why this would support data analysis	
	P3: Discuss the risks and challenges associated with data combination and how to mitigate them		

LO2: Examine common data analytics methods and the functions and features of the tools used to support this	**P4:** Explore common data analytics methods and the functions and features of common data analytic tools used to support this	**M3:** Demonstrate the ability to effectively apply data analytics methods and use appropriate tools to support analysis	**D2:** Compare and contrast a wide variety of data analytics tools and assess the key considerations for selection
	P5: Explain the factors that influence the selection of tools and methods of data analysis		
LO3: Investigate organisational data architecture and demonstrate how to design data models	**P6:** Describe the role and purpose of organisational data architecture and the characteristics of storage repositories that support data management	**M4:** Explore different storage repositories and compose recommendations to meet organisational requirements	**D3:** Assess the process of data modelling and reflect on the process of building a data model from conceptual stage to physical
	P7: Explain the stages of data modelling		
	P8: Create a logical data model to meet organisational requirements	**M5:** Apply the process of building a data model from conceptual stage to physical	

Unit 06 Data mining and statistical analysis (K/651/0929)

Unit summary				
This unit allows learners to embark on a journey into the realm of data mining and statistical analysis, acquiring indispensable knowledge and skills to extract meaningful insights from complex datasets.				
Assessment				
Internally assessed unit				
Mandatory	**Graded P/M/D**	**Level 4**	**30 credits**	**120 GLH**

Learning outcomes (LOs)	Mandatory teaching content
1. Examine the purpose of common statistical methodologies and their application to meet requirements	**Knowledge:** Statistical types and methods: • descriptive statistics • probability distributions • hypothesis testing • analysis of variance (ANOVA) • correlation analysis **Skills:** Apply statistical methods to meet data analysis requirements
2. Explore the purpose and application of statistical analysis	**Knowledge:** The purpose and application of descriptive, predictive, and prescriptive analytics Factors that influence the selection of an analytical model: • classification • regression • clustering Statistical programming languages and tools used when manipulating and processing data (for example, SQL, Python, R) The use of data preparation techniques for statistical analysis (for example, sorting, grouping, filtering)

Learning outcomes (LOs)	Mandatory teaching content
3. Demonstrate the selection and use of appropriate tools for statistical analysis	**Skills:** Apply data preparation techniques for the collation and use of data within a predictive analytical task Select and apply appropriate statistical programming language and tools to manipulate and process data Apply data analytical and modelling techniques to predict trends and patterns in data: • data mining • time series forecasting

Grading criteria

Learning outcomes (LOs)	Pass	Merit	Distinction
LO1: Examine the purpose of common statistical methodologies and their application to meet requirements	**P1:** Explain the purpose of common statistical methodologies	**M1:** Examine a range of statistical methods and illustrate how they can be used to meet data analysis needs	**D1:** Compare and contrast different statistical methods and assess pitfalls of each method
	P2: Define how to use statistical methods to meet data analysis requirements		
LO2: Explore the purpose and application of statistical analysis	**P3:** Outline the purpose and application of descriptive, predictive, and prescriptive analytics and identify factors that influence the selection of a model	**M2:** Discuss descriptive, predictive, and prescriptive analytics and provide guidelines for choosing the best technique and tool for varied problems	**D2:** Evaluate the use of descriptive, predictive, and prescriptive analytics explaining how these can be used together to inform business decisions
	P4: Explain the purpose of statistical programming languages and tools used for manipulating and processing data		
	P5: Describe the techniques used to prepare data for analysis		

Learning outcomes (LOs)	Pass	Merit	Distinction
LO3: Demonstrate the selection and use of appropriate tools for statistical analysis	**P6:** Explain how statistical programming languages can be used for predictive analytics	**M3:** Apply appropriate statistical programming language and tools to a collated dataset to manipulate data and perform predictive analytics	**D3:** Compare and contrast different statistical programming languages and tools and justify use cases for each
	P7: Describe how to use analytical and modelling techniques to predict trends and patterns in data		

Assessment strategies and principles relevant to this qualification

The key requirements of the assessment strategies or principles that relate to units in this qualification are summarised below.

The centre must ensure that individuals undertaking assessor or quality assurer roles within the centre conform to the assessment requirements for the unit they are assessing or quality assuring.

NCFE assessment strategy

Knowledge learning outcomes (LOs)

- assessors will need to be both occupationally knowledgeable and qualified to make assessment decisions
- internal quality assurers (IQAs) will need to be both occupationally knowledgeable and qualified to make quality assurance decisions

Competence/skills learning outcomes (LOs)

- assessors will need to be both occupationally competent and qualified to make assessment decisions
- IQAs will need to be both occupationally knowledgeable and qualified to make quality assurance decisions

Section 3: explanation of terms

This table explains how the terms used at level 4 in the content are applied to this qualification (not all verbs are used in this qualification).

Analyse	Break the subject or complex situations into separate parts and examine each part in detail. Identify the main issues and show how the main ideas are related to practice and why they are important. Reference to current research or theory may support the analysis.
Critically analyse	This is a development of 'analyse' which explores limitations as well as positive aspects of the main ideas in order to form a reasoned opinion.
Clarify	Explain the information in a clear, concise way showing depth of understanding.
Classify	Organise accurately according to specific criteria.
Collate	Collect and present information arranged in sequence or logical order that is suitable for purpose.
Compare	Examine the subjects in detail, consider and contrast similarities and differences.
Critically compare	This is a development of 'compare' where the learner considers and contrasts the positive aspects and limitations of the subject.
Consider	Think carefully and write about a problem, action or decision showing how views and opinions have been developed.
Demonstrate	Practical application of an element/content to show that you understand theories/concepts in a practical sense.
Describe	Provide a broad range of detailed information about the subject or item in a logical way.
Discuss	Write a detailed account that includes contrasting perspectives.
Draw conclusions (which…)	Make a final decision or judgement based on reasons.
Evaluate	Examine strengths and weaknesses, arguments for and against and/or similarities and differences. Judge the evidence from the different perspectives and make a valid conclusion or reasoned judgement. Apply current research or theories to support the evaluation.
Critically evaluate	This is a development of 'evaluate' where the learner debates the validity of claims from the opposing views and produces a convincing argument to support the conclusion or judgement.

Examine	Look closely at something. Think and write about the detail, and question it where appropriate.
Explain	Apply reasoning to account for how something is or to show understanding of underpinning concepts. Responses could include examples to support these reasons.
Explore	Consider an idea or topic broadly, searching out related and/or particularly relevant, interesting or debatable points.
Identify	Apply an in-depth knowledge to give the main points accurately (a description may also be necessary to gain higher marks when using compensatory marking).
Investigate	To inquire into (a situation or problem) to explore solutions
Justify	Give a detailed explanation of the reasons for actions or decisions.
Perform	Present/enact/demonstrate practically
Reflect	Learners should consider their actions, experiences or learning and the implications of these in order to suggest significant developments for practice and professional development.
Review and revise	Look back over the subject and make corrections or changes based on additional knowledge or experience.
Summarise	Give the main ideas or facts in a concise way to develop key issues.

Section 4: support

Support materials

The following support materials are available to assist with the delivery of this qualification and are available on the NCFE website:

- Qualification Factsheet

Useful websites

Centres may find the following websites helpful for information, materials and resources to assist with the delivery of this qualification:

- www.instituteforapprenticeships.org
- www.legislation.gov.uk
- https://realpython.com
- https://stackoverflow.com
- www.kaggle.com/datasets
- https://github.com

These links are provided as sources of potentially useful information for delivery/learning of this subject area. NCFE does not explicitly endorse these websites or any learning resources available on these websites. For official NCFE-endorsed learning resources, please see the additional and teaching materials sections on the qualification's page on the NCFE website.

Other support materials

The resources and materials used in the delivery of this qualification must be age-appropriate and due consideration should be given to the wellbeing and safeguarding of learners in line with your institute's safeguarding policy when developing or selecting delivery materials.

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Appendix A: units

To simplify cross-referencing assessments and quality assurance, we have used a sequential numbering system in this document for each unit.

Knowledge only units are indicated by a star. If a unit is not marked with a star, it is a skills unit or contains a mix of knowledge and skills.

Mandatory units

Unit number	Regulated unit number	Unit title	Level	Credit	GLH
Unit 01	A/651/0924	Legislation and security standards applied to data analytics	4	10	30
Unit 02	D/651/0925	Data fundamentals and lifecycle	4	20	90
Unit 03	F/651/0926	Data structure and databases	4	20	90
Unit 04	H/651/0927	Stakeholder engagement and user experience in data analytics	4	20	90
Unit 05	J/651/0928	Organisational data	4	20	90
Unit 06	K/651/0929	Data mining and statistical analysis	4	30	120

The units above may be available as stand-alone unit programmes. Please visit the NCFE website for further information.