QUALIFICATION SPECIFICATION

gateway qualifications

Access to HE

Apprenticeships

Digital

Employability & Enterprise

English & Maths

ESOL

Personal & Social Development

Professional Development

Vocational

Level 4 Certificate in Professional Practice in Data Analytics with Artificial Intelligence

This qualification specification covers the following qualification:

Qualification Number	Qualification Title
610/6307/1	Gateway Qualifications Level 4 Certificate in Professional Practice in Data Analytics with Artificial Intelligence

Version and date	Change detail	Section/Page Reference
1.0 July 2025	Version 1.0	Throughout

About this qualification specification

Gateway Qualifications is a nationally regulated Awarding Organisation that supports education and training providers through its strong relationships, adaptability and expert team.

This qualification specification contains everything you need to know about this qualification and should be used by everyone involved in the planning, delivery and assessment of the Level 4 Certificate in Professional Practice in Data Analytics with Artificial Intelligence.

This document should be read in conjunction with the Gateway Qualifications' Centre Handbook and other publications available on the website, which contain more detailed guidance on assessment and quality assurance practice.

In order to offer this qualification, you must be a Gateway Qualifications recognised centre and be approved to offer this qualification.

If your centre is not yet recognised, please contact our Business Development team to discuss becoming a Gateway Qualifications recognised centre:

Telephone: 01206 911211
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Introduction

In an era where data fuels innovation and artificial intelligence reshapes industries, the Level 4 Certificate in Professional Practice in Data Analytics with Artificial Intelligence offers a powerful gateway into one of the most in-demand fields of the digital age. This qualification is designed for aspiring data professionals who want to build practical, job-ready skills in analytics, programming, and ethical AI deployment.

Through a carefully curated set of units, learners will gain hands-on experience with the tools, techniques, and thinking required to turn raw data into meaningful insights and intelligent solutions.

The Level 4 Certificate in Professional Practice in Data Analytics with Artificial Intelligence content has been developed in partnership with Code Institute.

Qualification Overview

1.1 Qualification purpose

The Level 4 Certificate in Professional Data Analytics with Artificial Intelligence combines the Level 4 Award in Foundations of data analytics with Artificial Intelligence - No Code with the Level 4 Award in Advanced Data Analytics with Artificial Intelligence - Low Code. It provides a complete pathway from no background in data to advanced low-code analytics in one consistent programme.

Learners begin with no-code tools such as Excel, Google Sheets, and Power BI to build confidence in data collection, preparation, visualisation, and interpretation. They then progress to low-code techniques using Power Query, DAX, Python, and SQL to handle larger datasets, automate workflows, and create more advanced models and dashboards. Throughout the programme, learners use real-world datasets and curated scenarios to practise applying data analytics in realistic business contexts.

The qualification is designed to be relevant for both those in employment and those who are unemployed or reskilling. Employed learners apply skills directly to their workplace data challenges, increasing productivity and decision-making impact. Learners who are unemployed or seeking their first role use curated datasets and industry examples to build a portfolio that demonstrates competence and readiness for work across multiple sectors.

Generative AI is introduced as an assistive capability across the programme, helping learners with tasks such as code support, hypothesis generation, data cleaning, visualisation, and ethical risk checking. This ensures that learners are confident in using AI responsibly and productively.

By successfully achieving this qualification, learners will have the benefit of moving from zero to advanced low-code analytics in a single coherent pathway, strengthening employability and competitiveness.

1.2 Aims and objectives

The aims and objectives of the qualification are to:

- Build learners' confidence and capability in handling, analysing, and visualising data.
- Introduce the data lifecycle, classification, and key analytics tools without requiring programming.
- Foster foundational statistical understanding and ethical awareness in data handling.
- Enable learners to use AI-supported tools to accelerate insight generation and improve analysis workflows.
- Prepare learners for progression into further data education or digitally-enabled employment.
- Build learners' confidence and fluency in using low-code tools and introductory Python for data tasks
- Develop competence in statistics, machine learning, and ethical data practice
- Strengthen analytical thinking and business communication skills
- Introduce key database and data pipeline techniques with SQL
- Enable learners to use AI-supported tools to accelerate insight generation and improve analysis workflows.

1.3 Key Information

Qualification summary	
Qualification title	Gateway Qualifications Level 4 Certificate in Professional Practice in Data Analytics with Artificial Intelligence
Qualification type	VRQ
Qualification number	610/6307/1
Learning aim reference number	61063071
Level	4
Guided learning hours (GLH)	98
Total qualification time (TQT)	140
Credit value	14
Sector subject area	6.1 Digital technology (practitioners)
Age appropriateness	19+
Grading scale	Pass/Fail
Assessment method	Portfolio of Evidence
Regulation information	This qualification is regulated by Ofqual for use in England and Qualitifcations Wales for use in Wales.

1.4 Entry requirements

There are no mandatory prior qualifications required for this award. It is designed for beginners and non-technical professionals who want to develop data literacy and confidence in using no-code and low code analytics tools.

There are no specific prior skills/knowledge learners must have for this qualification, however learners should be proficient to at least Level 2 in English and Maths.

It is recommended that learners have a working knowledge of spreadsheets, including tasks such as sorting, use of formulas, creating simple charts, and basic file management.

Learners undertaking this qualification may be in employment, seeking work, or reskilling for a new role. For those in work, skills can be applied directly to workplace tasks and reporting. For those who are unemployed or reskilling, the qualification can be completed using curated datasets and industry scenarios to demonstrate employability.

Centres must ensure that learners have the correct information and advice when selecting qualifications to ensure that the qualification will meet their needs.

Centres must ensure that this qualification suits the age and abilities of their learners by ensuring that learners can meet the relevant literacy, numeracy, digital, and health and safety requirements of the qualification.

Learners enrolled on this qualification should not undertake another qualification at the same level with a similar title or content, as this could impact funding eligibility due to duplicated learning.

Centres are responsible for registering learners via the Gateway Qualifications' online registration portal Quartz. Learner registration guidance is available on our website, Registering learners.

1.5 Progression opportunities

On completion of this qualification learners will be equipped with the knowledge, skills and understanding related to Professional Practice in Data Analytics with Artificial Intelligence.

Successful completion of the Level 4 Certificate in Certificate in Professional Practice in Data Analytics with Artificial Intelligence will allow learners to progress onto:

- Gateway Qualifications Level 4 Diploma in Data Analytics with Artificial Intelligence
- Entry-level support roles in data-enabled teams (e.g., business support, marketing, administration)
- Level 4 Data Analyst apprenticeship
- Level 4 Business Analysis apprenticeship
- Prepare learners for progression into further data education or digitally-enabled employment.

A full in-depth careers information, advice and guidance session should be completed for learners before, during and after completion of learning, finding them the most appropriate progression pathways unique to them and based on their ability and aspirations.

1.6 Equity, diversity and inclusion

At Gateway Qualifications we aim to create an environment which celebrates differences and strives for equitable opportunities and outcomes for all. More than a mere commitment, this Equity, Diversity, and Inclusion Policy stands as a framework, informing every aspect of the work we do. It is our aim to support our staff and learners of all abilities, ensuring the development, delivery, and awarding of qualifications in a fair and inclusive manner.

Whilst developing our qualifications, we have given due consideration to eliminating discrimination, harassment and victimisation, advancing equality of opportunity, and fostering good relations between people who share a relevant protected characteristic (as defined in the Equality Act 2010) and those who do not.

For full details please see the Equity, Diversity and Inclusion Policy.

1.7 Support materials and resources

In addition to this qualification specification, the following resources are available for centres approved to offer the qualification:

- Code Institute Learner Management System (LMS) content to support delivery Build Your Tech Career with AI, Data Science, & Development
- Sample assignment briefs for each unit
- Sample assignment checklists for each unit
- Sample resource guides for each unit
- Sample data (where required)

1.8 Achieving this qualification

The qualification will be awarded to learners who successfully demonstrate their achievement of all learning outcomes of the units of the qualification and satisfy the rules of combination.

The knowledge, skills and understanding that will be assessed as part of the qualification are set out within the unit details.

To be awarded this qualification learners must successfully achieve all four mandatory units.

Mandatory units

Unit	Unit title	Unit reference	Credit value	GLH
Unit 01	Data preparation, analysis and visualisation	L/651/7392	4	43
Unit 02	Statistical and probabilistic methods in data analysis	M/651/7393	3	10
Unit 03	Foundations of data analytics with Python	K/651/7409	3	20
Unit 04	Databases with SQL, ethics and machine learning	D/651/7414	4	25

2. Assessment

2.1 Assessment overview

Portfolio of evidence only
The qualification is assessed through a portfolio of evidence which is internally assessed by centre staff and externally quality assured by Gateway Qualifications. For more information, please see the Centre Guide to Best Practice in Internal Assessment.

Each learner must build a portfolio of evidence generated from appropriate assessment tasks which demonstrates achievement of all the learning outcomes associated with each unit throught practical, work related tasks.

Assessment guidance is provided for each unit. Assessors may use alternative assessment methods as long as they are fit for purpose, meet the requirements of the qualification and ensure the integrity of the assessment process.

On completion of each unit learners must declare that the work produced is their own and the Assessor must counter sign this.

Should a learner not achieve the required standard to pass an assessment, further teaching and learning should take place before attempting the assessment again.

The qualification will be awarded to learners who successfully demonstrate their achievement of all learning outcomes of the units of the qualification.

For learners who are not successful in achieving the whole qualification but still achieve any full unit, a unit certificate of achievement may be awarded.

The knowledge, skills and understanding that will be assessed as part of the qualification are set out within the unit details.

2.2 Assessment language

This qualification will be assessed in English. All learners work must be in English. British Sign Language can be used where it is permitted for the purpose of a reasonable adjustment.

3. Unit Details

3.1 Mandatory units

Unit 01 – Data preparation, analysis and visualisation

Unit Reference:	L/651/7392
Unit Summary:	This unit helps learners understand how to work with data to find useful insights and share them clearly. Learners will gain practical skills in preparing and cleaning data, spotting patterns, and creating visuals like charts and graphs to tell a story.
GLH:	43
Credit Value:	4
Grading Method:	Pass/Fail

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The learner will:	**The learner can:**
1. Understand core concepts of data analytics.	1.1. Explain the fundamental concepts of data analytics, including its definition and how it differs from related fields such as business intelligence and data science. 1.2. Evaluate its applications across various business sectors. 1.3. Summarise the key characteristics of Big Data.
2. Understand key stages of the Data Analytics Life Cycle.	2.1. Explain the importance of each stage in the Data Analytics Life Cycle. 2.2. Evaluate how each stage of the Life Cycle contributes to deriving actionable insights and making informed decisions.
3. Be able to evaluate different data types.	3.1. Compare and evaluate quantitative and qualitative data using an evaluation framework 3.2. Classify data as structured, unstructured, or semi-structured. 3.3. Assess the significance of each data type for effective data analysis and interpretation.
4. Understand key data analytics and visualisation tools.	4.1. Explain and assess key data analytics and visualisation tools. 4.2. Demonstrate understanding of setup and installation processes for essential software, equipping you to effectively use these tools for data analysis and visualisation.
5. Be able to demonstrate effective data visualisations that analyse and interpret datasets.	5.1. Classify key types of data visualisations and consider their appropriate use cases.

	5.2. Demonstrate the use of appropriate software tools to create basic visualisations from given datasets. 5.3. Evaluate the advantages and limitations of advanced visualisation techniques compared to basic ones, and draw conclusions about how they enhance data storytelling.
6. Be able to demonstrate effective data handling techniques.	6.1. Explain how effective data handling contributes to accurate analysis and model building. 6.2. Demonstrate proficiency in applying data cleaning, feature engineering, and data transformation techniques. 6.3. Classify different data preprocessing methods according to their purpose and function.
7. Be able to apply advanced visualisation techniques to analyse complex datasets.	7.1. Use advanced visualisation methods to analyse complex data 7.2. Assess the effectiveness of visualisation techniques 7.3. Create interactive visuals that communicate insights to targeted audiences
8. Be able to design and execute a basic data analysis project.	8.1. Design and execute a data analysis project and provide appropriate documentation. 8.2. Clarify and communicate complex technical information in a way that is accessible to both technical and non-technical stakeholders. 8.3. Demonstrate the use of meaningful visualisations and generate insights from data using appropriate statistical concepts. 8.4. Draw conclusions from their analysis and justify an informed business recommendation based on the evidence.

Delivery Guidance: Data analytics and Python for data preparation

Learning Outcome 1:
Explain the fundamental concepts of data analytics, including its definition and how it differs from related fields such as business intelligence, and data science. (AC 1.1):

- Data analytics is the process of examining data sets to uncover hidden patterns, correlations, trends, and insights.
- It involves digging into the data to reveal insights that may not be immediately apparent.
- The purpose of data analytics is to transform raw data into actionable insights that inform strategic decision-making and drive business success.
- Business Intelligence differences: BI's focus on converting data into actionable intelligence for real-time decision-making. They develop dashboards and reports to display key metrics and performance indicators, using tools like Power BI and SQL to provide executives with a real-time view of the organisation's performance, enabling them to make informed decisions quickly.
- Data Science distinctions: It involves using advanced techniques such as machine learning, statistical modelling, and predictive analytics to uncover patterns and forecast future trends.

Evaluate its applications across various business sectors. (AC1.2):

- Retail and E-commerce: sales forecasting, managing customer relationships, and setting pricing strategies. By analysing historical sales data, customer behaviour, and market trends, companies can predict future sales patterns, manage inventory, tailor sales strategies to different customer segments, and dynamically adjust pricing to maximise revenue.
- Healthcare and Life Sciences: patient readmission risk prediction, treatment pathway optimisation, resource allocation and capacity planning, drug discovery patterns, population health management, medical imaging analysis
- Financial Services: credit scoring and loan default prediction, anti-money laundering and fraud detection, customer churn prediction, portfolio risk analysis, regulatory compliance monitoring, algorithmic trading strategies
- Manufacturing: predictive maintenance using IoT data, quality control and defect prediction, supply chain optimisation, production scheduling, energy consumption analysis, supplier performance analytics

Summarise the key characteristics of Big Data. (AC 1.3):

- Big Data is characterised by its large volume, high velocity, and diverse variety.
- It’s used to effectively manage and analyse large, complex datasets by understanding their characteristics.

Learning Outcome 2:
Explain the importance of each stage in the Data Analytics Life Cycle. (AC 2.1):
Problem Statement Formulation:

- What is the central problem?
- Who experiences the impact of this issue?
- What is the intended resolution?
- Are there any quantifiable objectives that need to be achieved?
- What steps are required for implementation?

Data Collection

- Primary Methods:
    - Transactional Data Collection

    - Surveys
    - Questionnaires
    - Interviews
    - Observations
- Secondary Sources:
    - Databases
    - APIs
    - Public Datasets
    - Industry Reports
    - Censuses
    - Social Media and Online Content

Data Cleaning

- Handling Missing Values
- Correcting Inconsistencies
- Removing Duplicates
- Identifying and Removing Outliers
- Integrating Data

Exploratory Data Analysis (EDA):

- Summarises and visualises data to understand its structure and patterns using descriptive statistics, charts, and graphs to identify basic trends and relationships.
- Trend Analysis:
    - Identifies trends over time (e.g., sales, customer traffic, product popularity) to pinpoint periods of decline and assess the impact of various factors.
- Correlation Analysis:
    - Examines relationships between variables (e.g., marketing campaigns and sales, demographics and purchasing) to understand mutual influence.
- Segmentation Analysis:
    - Group customers by characteristics (e.g., purchase behaviour, visit frequency, demographics) to reveal insights into sales drivers and hindrances.
- Predictive Analysis:
    - Uses statistical models or machine learning to forecast future sales trends based on historical data and predict the impact of changes.
- Data Visualisation:
    - chart selection based on message, dashboard design principles, colour theory and accessibility, interactive elements, storytelling techniques, and annotation strategies

Evaluate how each stage of the Life Cycle contributes to deriving actionable insights and making informed decisions. (AC 2.2):

- Insight Generation:
    - pattern recognition (trends, cycles, anomalies), comparative analysis and benchmarking, predictive indicators' identification, root cause analysis techniques, correlation vs causation understanding
- Decision Support:
    - decision trees and scenario planning, risk-reward analysis, what-if analysis capabilities, recommendation engines, performance monitoring systems
- Value Realisation:
    - ROI calculation methodologies, impact measurement, continuous improvement cycles (PDCA), success story documentation, stakeholder satisfaction measurement

Learning Outcome 3:
Compare and evaluate quantitative and qualitative data using an evaluation framework (AC 3.1:)

Quantitative data refers to information that can be measured and expressed in numerical terms. It's the objective side of data, used for statistical analysis. It enables precise comparisons and identifies trends. Examples include height, temperature, and revenue. It can be discrete data, representing values that can take on only specific, distinct values. These are typically whole numbers. For instance, the number of employees in a company, the number of products sold, or the number of cars on the road. Continuous Data is more fluid. It can take any value within a range and be infinitely divisible. Continuous data flows smoothly, enabling precise analysis.

Qualitative data: Describes and categorises rather than measures. For example, attributes and characteristics. Social media posts or survey response data help us understand the qualitative aspects of our subject.

Nominal versus Ordinal. Nominal Data is categorisation without any order. E.g. gender, types of fruit, or nationality. Ordinal Data has a clear order or ranking. For example, education levels or customer satisfaction ratings.

Classify data as structured, unstructured, or semi-structured. (AC 3.2):

- Structured Data: Data neatly organised in a fixed schema, often displayed in tabular form. Easily searchable and analysable, for quick and precise data retrieval. For example, databases or spreadsheets.
- Unstructured Data: No predefined structure and comes in formats like text, images, and videos. Social media posts, emails, and videos are all examples.
- Semi-structured Data: This format doesn't adhere to a fixed schema but uses tags or markers to organise elements. XML files and JSON documents are examples that provide some structure while allowing for varied data representation.

Assess the significance of each data type for effective data analysis and interpretation. (AC 3.3):

- Analysis Method Impact:
  - Structured data databases and spreadsheets enable efficient data management and streamlined analysis.
  - Unstructured data captures rich, detailed information, offering deep insights that structured formats might miss.
  - Semi-structured data strikes a balance between flexibility and organisation.
- Interpretation Challenges: Understanding the structure of data is crucial for managing, storing, and analysing it, as well as for selecting the right tools and methods for decision-making.

Learning Outcome 4:
Explain and assess key data analytics and visualisation tools. (AC 4.1):

- Tools
  - Excel, Power BI and Tableau
- Techniques
  - Describe a dataset with statistics.
  - Use DAX to aggregate, apply conditional logic, and filter data for analysis and reporting.
  - Use BI tools to visualise data.
- Significance
  - Understanding business requirements is crucial for aligning our work with organisational goals and delivering actionable insights.
  - Interactive, DAX-powered dashboards enable stakeholders to visually explore data, uncover trends, and make informed decisions. DAX facilitates

dynamic metric calculations (e.g., Total Sales, Total Quantity, Average Order Value), ensuring accurate and flexible analysis.
    - Building adaptive dashboards provides tailored insights, empowering decision-makers to act confidently on the data.

Demonstrate understanding of setup and installation processes for essential software, equipping you to effectively use these tools for data analysis and visualisation. (AC 4.2):

- Emphasise step-by-step installation, including:
    - Checking system requirements
    - Downloading installers from official sources
    - Completing installation wizards
    - Understanding directory paths and where files are stored
    - Configuring first-time setup options
    - Organise project directories
    - Use consistent naming conventions
    - Manage data files securely and ethically (link to data governance)
    - Ensure local settings don't violate security policies

Learning Outcome 5:
Classify key types of data visualisations and consider their appropriate use cases. (AC 5.1):

Comparison Visualisations:

- Used to compare categories or metrics.
- Examples:
    - Bar chart
    - Column chart
    - Stacked bar
    - Dot plots
- Use case examples:
    - Comparing sales performance by product
    - Staffing levels by department

Trend / Time Series Visualisations

- Used to show change over time.
- Examples:
    - Line chart
    - Area chart
- Use case examples:
    - Monthly revenue trends
    - Daily website traffic

Composition Visualisations

- Used to show how parts contribute to a whole.
- Examples:
    - Pie chart (with caution)
    - Donut chart
    - Treemap
    - Stacked area chart
- Use case examples:
    - Market share by region
    - Distribution of booking sources

- Encourage learners to critically evaluate when NOT to use pie charts.

Demonstrate the use of appropriate software tools to create basic visualisations from given datasets. (AC 5.2):

- Tools
  - Power BI Desktop and Tableau Public
- Techniques
  - Apply the three essential elements of data storytelling: Data, Visuals, and Narrative.
  - These elements provide a structured approach for verifying trends, analysing key data points, and communicating insights clearly.
- Match the visualisation type with the data type and the message to be conveyed.

Evaluate the advantages and limitations of advanced visualisation techniques compared to basic ones, and draw conclusions about how they enhance data storytelling. (AC 5.3):

Storytelling is the "why" behind the data, empowering users to make informed and impactful decisions.

Data provides factual insights and forms the foundation of our story. Visuals, such as charts and dashboards, simplify complex information, making trends and patterns easier to interpret.

Narrative connects data points into a logical, engaging storyline, adding relevance and meaning to the insights.

Identify trends by analysing historical data to verify patterns, such as increases in product returns. After confirming the trend, analyse key data points, such as customer feedback or demographic data, to uncover root causes.

Construct a narrative that clearly presents insights and smoothly transitions from problem identification to actionable recommendations.

Learning Outcome 6:
Explain how effective data handling contributes to accurate analysis and model building. (AC 6.1):

- Standardisation ensures consistency across our dataset.
- Cleaning offers a straightforward approach to organising and formatting data.
- Duplicate removal ensures each entry is counted only once.
- Removing outliers is a critical step for maintaining reliability, which enhances efficiency and clarity in our analysis.
- Feature engineering is transforming our dataset into a robust source for analysis.

Demonstrate proficiency in applying data cleaning, feature engineering, and data transformation techniques. (AC 6.2):

- Power Query, Tableau Online and Excel.
- Excel provides an accessible platform ideal for basic cleaning tasks and initial DAX data exploration.
- Power Query and Tableau Online enable a seamless transition from data cleaning to visualisation, allowing us to analyse and report directly within the same platform.

Classify different data preprocessing methods according to their purpose and function. (AC 6.3):

- Standardise data formats, names, and categories.
- Handle missing values by deleting, imputing, or replacing values to fill gaps accurately.
- Remove duplicate entries to maintain data accuracy.
- Manage outliers to prevent any skewed analysis.
- Feature engineering to generate new insights by creating additional data fields.

Learning Outcome 7:
Use advanced visualisation methods to analyse complex data (AC 7.1):
Distribution Visualisations

- Used to show frequency patterns and variability.
- Examples:
    - Histogram
    - Boxplot
    - Density plot
- Use case examples:
    - Customer age distribution
    - Variation in delivery times

Relationship Visualisations

- Used to show correlations and interactions between variables.
- Examples:
    - Scatter plot
    - Bubble plot
    - Heatmap
- Use case examples:
    - Relationship between price and demand
    - Correlation between marketing spend and leads

Assess the effectiveness of visualisation techniques (AC 7.2):

- Visualisations simplify complex data, making it more accessible and actionable.
- A well-structured dashboard ensures that our visualisations are not only professional but also easy to navigate and interpret, delivering maximum value to users.

Create interactive visuals that communicate insights to targeted audiences (AC 7.3):

- Slicers and filters are interactive tools that help us focus on specific details and customise our analysis.
- Dashboards are insightful, interactive, and aligned with organisational objectives.

Learning Outcome 8:
Design and execute a data analysis project and provide appropriate documentation. (AC 8.1):

Business requirements are a critical first step in any analysis.
Build interactive dashboards that bring analysis to life.
Knowledge application in the workplace.
DAX enables the dynamic calculation of metrics such as Total Sales, Total Quantity, and Average Order Value.

Clarify and communicate complex technical information in a way that is accessible to both technical and nontechnical stakeholders. (AC 8.2):

- Building interactive dashboards allows you to provide tailored insights to stakeholders.
- Dashboards that adapt to user inputs make data exploration intuitive, empowering decision-makers to uncover trends and act confidently on the insights you provide.

Demonstrate the use of meaningful visualisations and generate insights from data using appropriate statistical concepts. (AC 8.3):

- DAX calculations ensure your analysis is both accurate and flexible.
- Dashboards, powered by DAX, enable stakeholders to visually explore data.

Draw conclusions from their analysis and justify an informed business recommendation based on the evidence. (AC 8.4):

- Aligning work with organisational goals ensures that key challenges are addressed and actionable insights delivered.
- Dashboards, powered by DAX, enable stakeholders to uncover trends and make informed, data-driven decisions.

Assessment guidance:

AC1 (Learning Outcome 1):

Type of evidence: Data Dashboard, Written or recorded presentation, case study summaries, project plan

Assessment criteria: 1.1, 1.2, 1.3

Additional information: Example assessment: A written exam with practical questions requiring the learner to apply their data analysis skills to the project data set in order to find the correct answer. Additionally, knowledge-based questions require learners to apply the knowledge of data analysis they have gained from the programme.

AC2 (Learning Outcome 2):

Type of evidence: Data Dashboard, Written or recorded presentation, case study summaries, project plan

Assessment criteria: 2.1, 2.2

Additional information: Example assessment: A written exam with practical questions requiring the learner to apply their data analysis skills to the project data set in order to find the correct answer. Additionally, knowledge-based questions require learners to apply the knowledge of data analysis they have gained from the programme.

AC3 (Learning Outcome 3):

Type of evidence: Data Dashboard, Written or recorded presentation, case study summaries, project plan

Assessment criteria: 3.1, 3.2

Additional information: Example assessment: A written exam with practical questions requiring the learner to apply their data analysis skills to the project data set in order to find the correct answer. Additionally, knowledge-based questions require learners to apply the knowledge of data analysis they have gained from the programme.

AC4 (Learning Outcome 4):

Type of evidence: Written or recorded presentation, case study summaries, project plan, Excel spreadsheet, Power BI Dashboard or Tableau Dashboard

Assessment criteria: 4.1, 4.2

Assessment guidance:
Additional information: Example assessment: The Data Dashboard contains nine appropriate visuals, each titled and labelled. The project is interactive and well-implemented for both technical and non-technical audiences to gain insight into the dataset. The software features are used for their intended purposes, and no error messages appear.
AC5 (Learning Outcome 5): **Type of evidence:** Data Dashboard, Written or recorded presentation, case study summaries, project plan, Excel spreadsheet **Assessment criteria:** 5.1, 5.2, 5.3 **Additional information:** Example assessment: The Data Dashboard contains nine appropriate visuals, each titled and labelled. The project is interactive and well-implemented for both technical and non-technical audiences to gain insight into the dataset. The software features are used for their intended purposes, and no error messages appear.
AC6 (Learning Outcome 6): **Type of evidence:** Data Dashboard, Written or recorded presentation, case study summaries, project plan **Assessment criteria:** 6.1, 6.2, 6.3 **Additional information:** Example assessment: A written exam with practical questions requiring the learner to apply their data analysis skills to the project data set in order to find the correct answer. Additionally, knowledge-based questions require learners to apply the knowledge of data analysis they have gained from the programme.
AC7 (Learning Outcome 7): **Type of evidence:** Data Dashboard, Written or recorded presentation, case study summaries, project plan **Assessment criteria:** 7.1, 7.2, 7.3 **Additional information:** Example assessment: The Data Dashboard contains nine appropriate visuals, each titled and labelled. The project is interactive and well-implemented for both technical and non-technical audiences to gain insight into the dataset. The software features are used for their intended purposes, and no error messages appear.
AC8 (Learning Outcome 8): **Type of evidence:** Data Dashboard, Written or recorded presentation, case study summaries, project plan **Assessment criteria:** 8.1, 8.2, 8.3

Assessment guidance:
Additional information: Example assessment: The Data Dashboard contains nine appropriate visuals, each titled and labelled. The project is interactive and well-implemented for both technical and non-technical audiences to gain insight into the dataset. The software features are used for their intended purposes, and no error messages appear.

Unit 02 – Statistical and probabilistic methods in data analysis

Unit Reference:	M/651/7393
Unit Summary:	This unit introduces learners to key statistical and probabilistic methods used to explore and interpret data. Learners will develop practical skills in summarising data using descriptive statistics and understanding the role of probability in measuring uncertainty and supporting predictions.
GLH:	10
Credit Value:	3
Grading Method:	Pass/Fail

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The learner will:	**The learner can:**
1. Be able to apply descriptive statistical techniques to summarise datasets.	1.1 Explain the purpose of descriptive statistics. 1.2 Demonstrate how to calculate key measures of central tendency 1.3 Clarify the interpretation of measures of dispersion 1.4 Describe common data distributions. 1.5 Evaluate their relevance in effectively summarising and analysing datasets.
2. Be able to apply descriptive statistical techniques using spreadsheets.	2.1 Demonstrate and evaluate the application of descriptive statistical techniques using spreadsheets. 2.2 Analyse and interpret business data to draw meaningful conclusions.
3. Be able to apply probability concepts, rules, and distributions to conduct business analysis using spreadsheets.	3.1. Describe probability concepts, types, and their relevance in data analytics 3.2. Apply fundamental probability rules to analytical scenarios 3.3. Explain the use of probability distributions in data analysis 3.4. Use spreadsheets to apply probability techniques for business analysis 3.5. Assess proficiency in using spreadsheets for independent probability-based data analysis

Delivery Guidance: Data analytics and Python for data preparation

Learning Outcome 1:
Explain the purpose of descriptive statistics. (AC 1.1):

- Data simplification and organisation are achieved through summarisation, which condenses complex data into clear, concise overviews.
- Effective data structuring, or organisation, highlights key features.
- Description encompasses aspects of data distribution, concentration, and variability.

Demonstrate how to calculate key measures of central tendency (AC 1.2):

Measures of central tendency include the mean, median, and mode

Clarify the interpretation of measures of dispersion (AC 1.3):

Spread of data is characterised by range, variance, standard deviation, and interquartile range (IQR).

Describe common data distributions. (AC 1.4):

- Distributions range from the bell-shaped normal distribution, where data lean towards the centre, to skewed distributions, where data lean towards one side, and to uniform distributions, where each value has an equal likelihood.

Evaluate their relevance in effectively summarising and analysing datasets. (AC 1.5):

- Large datasets can be transformed into meaningful insights, highlighting significant trends and patterns for easier identification and interpretation.
- The mean is a powerful averaging method, though susceptible to outliers.
- The median provides a more robust central measure, particularly when dealing with extreme values.
- The mode indicates the most frequent value, helping to understand data repetition.
- The range provides a simple measure of the difference between the minimum and maximum values.
- Variance and standard deviation offer deeper insights into the deviation of individual data points from the mean.
- Finally, the interquartile range (IQR) provides a focused view of the central 50% of the data.

Learning Outcome 2:
Demonstrate and evaluate the application of descriptive statistical techniques using spreadsheets. (AC 2.1):

- Excel
- Techniques
    - Spreadsheet formulae such as =AVERAGE(range), =MEDIAN(range), =MODE(range), =MIN(range), =MAX , =QUARTILE.INC(range, 1), and =STDEV(range).
    - Calculations such as for range, using =MAX(range)-MIN(range) or for IQR using =QUARTILE.INC(range, 3)-QUARTILE.INC(range, 1)

Analyse and interpret business data to draw meaningful conclusions.(AC 2.2):

- Mean gives you the average value of your dataset.
- The median is the middle value when your data is ordered.
- Mode identifies the most frequently occurring number in your data.
- Minimum value is the lowest value in your dataset.

- Maximum is the highest value.
- Range is the difference between the highest and lowest values.
- IQR (Interquartile Range) measures the spread of the middle 50% of your data.
- Standard Deviation) gives a sense of how spread out your data is.

Learning Outcome:
Describe probability concepts, types, and their relevance in data analytics (AC 3.1):
Theoretical Probability is based on known outcomes.
Experimental Probability relies on actual data.
Subjective Probability is shaped by personal judgment.

Apply fundamental probability rules to analytical scenarios (AC 3.2):
- The Probability of an Event is calculated by dividing the favourable outcomes by the total outcomes.
- Rules include the Complement Rule, Addition Rule, and Multiplication Rule.
- Condition probability calculates the probability of an event occurring given that another event has already occurred.

Explain the use of probability distributions in data analysis (AC 3.3):
Types of Probability Distributions include
Discrete Distributions, which involve countable outcomes.
These use the Probability Mass Function (PMF) or Cumulative Distribution Function (CDF).
Key examples include the Binomial and Poisson distributions. Continuous Distributions handle infinite outcomes.
They utilise Probability Density Functions (PDFs) and Cumulative Distribution Functions (CDFs), with the Normal distribution being a prominent example.

Use spreadsheets to apply probability techniques for business analysis (AC 3.4):
- For calculating Mean, use =AVERAGE(range).
- For calculating SD, use =STDEV(range).
- For calculating probability, use =NORM.DIST(X, Mean, SD, TRUE).

Assess proficiency in using spreadsheets for independent probability-based data analysis (AC 3.5):
- Probability is a powerful tool that measures how likely an event is to occur.
- It quantifies uncertainty by giving us a value between 0 and 1, where 0 means impossible and 1 means certain.
- Probability plays a crucial role in various areas, such as risk assessment, trend forecasting, analysing customer behaviour, and conducting A/B testing.

Assessment guidance:

AC1 (Learning Outcomes 1):
Types of evidence: Spreadsheet with formulas and labelled results; annotated screenshots or embedded notes explaining interpretation. Worked examples in a spreadsheet.

Assessment criteria: 1.1, 1.2, 1.3, 1.4, 1.5

Additional information: Example assessment: A written exam with practical questions requiring the learner to apply their data analysis skills to the spreadsheet data set in order to find the correct answer. Also, knowledge-based questions where learners apply the

Assessment guidance:
knowledge of statistics they have gained from the programme.
AC2 (Learning Outcomes 2): **Types of evidence:** Spreadsheet with formulas and labelled results; annotated screenshots or embedded notes explaining interpretation. Worked examples in a spreadsheet. Reflection on the advantages of spreadsheet-based analysis. **Assessment criteria:** 2.1, 2.2 **Additional information**: Example assessment: A written exam with practical questions requiring the learner to apply their data analysis skills to the spreadsheet data set in order to find the correct answer. Also, knowledge-based questions where learners apply the knowledge of statistics they have gained from the programme.
AC3 (Learning Outcomes 3): **Types of evidence:** Spreadsheet with formulas and labelled results; annotated screenshots or embedded notes explaining interpretation. Worked examples in a spreadsheet. Scenario-based A/B test or probability task **Assessment criteria:** 3.1, 3.2, 3.3, 3.4, 3.5 **Additional information**: Example assessment: A written exam with practical questions requiring the learner to apply their data analysis skills to the spreadsheet data set in order to find the correct answer. Also, knowledge-based questions where learners apply the knowledge of probability they have gained from the programme.

Unit 03 – Foundations of data analytics with Python

Unit Reference:	K/651/7409
Unit Summary:	This unit introduces learners to the foundational concepts and practical skills needed to perform data analytics using Python. Learners will explore core statistical ideas, basic programming techniques, and essential methods for preparing and transforming data for analysis.
GLH:	20
Credit Value:	3
Grading Method:	Pass/Fail

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The learner will:	**The learner can:**
1. Be able to demonstrate core Python programming skills for data analytics.	1.1 Clarify the use of Python variables, data types, and control structures 1.2 Apply basic operations 1.3 Explain how data structures and libraries like NumPy and Pandas are used for data manipulation and analysis.
2. Be able to apply statistical concepts and techniques to explore and interpret data.	2.1 Analyse data and apply appropriate statistical concepts to practical scenarios 2.2 Demonstrate an understanding of descriptive and inferential techniques and their use in real-world data problems.
3. Be able to demonstrate data handling in the context of data science.	3.1 Explain how effective data handling contributes to accurate analysis and model development. 3.2 Demonstrate proficiency in data cleaning, feature engineering, and data transformation. 3.3 Classify different data preprocessing methods.

Delivery Guidance: Foundations of Data Analytics with Python

Learning Outcome 1:
Python variables, data types, and control structures (AC 1.1):

- Python programming, focusing on using control structures (if statements, loops) and data structures (lists, tuples, dictionaries) to manage and filter data collections
- Learners will explore conditional logic and loops to repeat tasks.
- Working with lists, tuples, and dictionaries to organise and process data. Integrating statistical results into structured Python data structures for further analysis.

Applying basic operations (AC 1.2):

- Arithmetic Operations from Python's math module
- String Operations: concatenation, formatting with f-strings, string methods to contextualise the calculations
- Comparison and Logical: equality and inequality operators, greater than and less than and boolean
- Built-in Functions

Data structures and libraries (NumPy and Pandas) for manipulation and analysis (AC 1.3):

- NumPy Fundamentals:
  - Array: quick array manipulation, statistical calculations, data aggregation, and correlation analysis.
- Pandas Essentials:
  - Data Selection: To easily manage, transform, and analyse structured data for data-driven insights.
  - Basic Operations: data loading, exploration, manipulation, and analysis using data structures like DataFrames and Series.
- Integration Benefits: NumPy for efficient array computations, Pandas for data manipulation and analysis

Learning Outcome 2:
Analysing data and applying statistical concepts to practical scenarios (AC 2.1):

- Understanding Hypothesis Testing and Statistical Significance: This introduces the concept of hypothesis testing, focusing on the null and alternative hypotheses, p-values, and significance testing. Learners will explore ANOVA, T, and Chi-square tests, applying these methods to real-world datasets to evaluate statistical significance. Using spreadsheets, they will conduct statistical tests and calculate confidence intervals to assess the reliability of the data and identify trends.
- Key areas of focus: Understanding p-values, significance levels, and hypothesis formulation. Conducting ANOVA, T-tests, and Chi-square tests to determine statistical significance.
- Applying confidence intervals to assess the reliability of conclusions. Performing hypothesis testing in spreadsheets and other tools.
- Central Tendency Measures: calculating mean, median, mode, and when to use each measure
- Dispersion Measures: variance, standard deviation, range calculations, interquartile range (IQR), and when to use them
- Correlation Analysis: Pearson correlation, interpreting correlations, causation vs correlation warning
- Practical Applications: customer behaviour analysis, sales trend identification, quality control metrics, risk assessment, performance benchmarking

Descriptive and inferential techniques for real-world problems (AC 2.2):

- Descriptive Statistics Implementation:
    - Differentiating descriptive and inferential statistics. Introduction to data visualisation (histograms, box plots).
    - Calculate descriptive statistics and create visualisations in a shared virtual environment.
    - Create and interpret visualisations in spreadsheets to identify patterns, trends, and outliers.
    - Link visual outcomes to statistical concepts, such as central tendency and variability.
- Inferential Statistics Basics:
    - Sampling Concepts: sample vs population, sample size considerations, sampling bias awareness
    - Hypothesis Testing Introduction: null and alternative hypotheses, t-tests, p-value interpretation, confidence intervals, Type I and II errors
- Real-World Problem-Solving: A/B testing scenarios, customer segmentation, predictive analytics basics, quality assurance, business forecasting

Learning Outcome 3:
How effective data handling contributes to accurate analysis and model development (AC 3.1):

- Data Quality Impact: garbage in, garbage out principle, accuracy and reliability, bias prevention, decision-making implications
- Data Integrity Principles: consistency maintenance, completeness requirements, validity checks, uniqueness constraints, timeliness considerations
- Business Value: cost of poor data quality, ROI from data cleaning, competitive advantages, regulatory compliance, stakeholder trust
- Best Practices: documentation standards, version control basics, testing procedures, validation protocols, quality metrics

Proficiency in data cleaning, feature engineering, and data transformation (AC 3.2):

- Handling missing data, outliers, and inconsistencies using Python or BI tools.
- Data wrangling techniques using Pandas and NumPy for high-performance processing.
- Handling categorical and numerical data transformations
- Exploratory Data Analysis (EDA) as part of the data cleaning pipeline.

Classifying different data preprocessing methods (AC 3.3):

- Cleaning Methods Classification:
    - Removal Methods: dropping nulls, removing duplicates, outlier elimination, feature selection, row/column filtering
    - Imputation Methods: statistical filling, forward/backward fill, interpolation, model-based imputation, domain-specific rules
    - Correction Methods: format standardisation, typo fixing, unit conversion, date parsing, encoding fixes
- Feature Engineering:
    - Creates new features and combines datasets using pandas functions or BI tools to produce a unified and enriched dataset.

Assessment guidance:
AC1 (Learning Outcome 1): **Type of evidence:** Python code in a Jupyter notebook, Exam **Assessment criteria:** 1.1, 1.2, 1.3 **Additional information:** Write Python code to apply machine learning solutions to solve complex problems and enhance decision-making. Identify the correct Python package libraries for the task and evaluate your solution code. No complex programming required - focus on understanding and applying basics. Use hands-on problem-solving to test your ability to apply the skills you have learned. Assess understanding of core concepts and theoretical knowledge.
AC2 (Learning Outcome 2): **Type of evidence:** Statistical analysis project, Exam **Assessment criteria:** 2.1, 2.2 **Additional information:** Complete statistical analysis of business dataset, demonstrating both descriptive and inferential techniques. Conduct a simple hypothesis test (t-test) and interpret the results in a business context. Build a basic linear regression model using a Python ML package with interpretation of coefficients and R-squared.
AC3 (Learning Outcome 3): **Type of evidence:** Python code in a Jupyter notebook, Exam **Assessment criteria:** 3.1, 3.2, 3.3 **Additional information:** Write Python code to apply machine learning solutions to solve complex problems and enhance decision-making. Justify the algorithm used and evaluate your solution code. No complex programming required - focus on understanding and applying basics. Use hands-on problem-solving to test your ability to apply the skills you have learned. Assess understanding of core concepts and theoretical knowledge.

Unit 04 – Databases with SQL, ethics and machine learning

Unit Reference:	D/651/7414
Unit Summary:	This unit introduces learners to key concepts and practical skills in working with databases using SQL, alongside an understanding of ethical and responsible data use. Learners will develop the ability to store, retrieve and manage data using SQL queries, and will explore the importance of data privacy, governance, and clear communication when handling information.
GLH:	25
Credit Value:	4
Grading Method:	Pass/Fail

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The learner will:	**The learner can:**
1. Be able to demonstrate effective data management techniques.	1.1 Explain how an SQL database can be used to manage data. 1.2 Classify SQL statements used for data manipulation and aggregation. 1.3 Demonstrate the ability to execute SQL queries to retrieve and manipulate data. 1.4 Explain the role of database relationships. 1.5 Classify different join types, including Left, Right, Inner & Outer Join. 1.6 Explain the syntax, structure, and common data types used in SQL to support effective interaction with relational databases.
2. Be able to demonstrate knowledge of key machine learning principles and apply models using Python.	2.1. Demonstrate an understanding of machine learning concepts, algorithms, and their applications. 2.2. Develop practical skills in implementing and evaluating machine learning models using Python.
3. Understand the significance of data standards, legal and regulatory frameworks for responsible data use.	3.1. Describe the importance of data standards, legal frameworks, and regulatory compliance. 3.2. Explain their role in ensuring ethical, secure, and responsible data handling.
4. Be able to design and execute a basic data analysis project.	4.1. Demonstrate the ability to plan, execute, and document a complete data analysis project. 4.2. Communicate complex technical information clearly and concisely to both technical and non-technical stakeholders.

	4.3. Generate meaningful visualisations and insights from data using appropriate statistical concepts. 4.4. Draw conclusions based on data insights to justify an informed business decision.

Delivery Guidance: Databases with SQL, Ethics and Machine Learning

Learning Outcome 1:
How SQL databases can be used to manage data (AC 1.1):

- Fundamental concepts of relational databases.
- Through ERDs and understanding how tables relate to each other, learners gain insight into the structure and organisation of data.
- Key concepts include tables, rows, columns, and primary and foreign keys. Overview of database structures: How data is stored, organised, and retrieved efficiently.
- Real-World Context: Databases include Customer Relationship Management (CRM), inventory management, and library systems.
- Use case: How businesses rely on relational databases to manage large volumes of structured data.
- Business Applications: customer relationship management (CRM), inventory management systems, e-commerce platforms, financial transaction processing, reporting and analytics, data warehousing

SQL statements for data manipulation and aggregation (AC 1.2):

- What is SQL (Structured Query Language), and why is it essential for databases?

Executing SQL queries to retrieve and manipulate data (AC 1.3):

- Explanation of key SQL components: SELECT, FROM, WHERE, and ORDER BY.
- Demonstrates basic SQL commands on an online SQL platform
- Understand the purpose and syntax of basic SQL commands. Be able to write and execute SQL queries to retrieve, filter, and sort data from relational databases.
- Debug SQL queries effectively.

Role of database relationships (AC 1.4):

- Relationship Types: one-to-one relationships (user profiles), one-to-many relationships (customers-orders), many-to-many relationships (students-courses), self-referencing relationships (employee-manager)
- Foreign Keys: referential integrity enforcement, cascade operations, relationship constraints, preventing orphaned records, maintaining consistency
- Entity-Relationship Concepts: entities as tables, attributes as columns, relationships as foreign keys, ER diagram basics

Classify different join types, including Left, Right, Inner & Outer Join (AC 1.5):

Joins in SQL are essential for combining data from two or more tables based on related columns. They enable us to retrieve meaningful insights from relational databases by merging data points that share a common relationship.

SQL Joins combine data from multiple tables based on related columns.

Joins merge and retrieve related data for analysis.

Use case: Joins enable integrated analysis across tables.

Explain the syntax, structure, and common data types used in SQL to support effective interaction with relational databases (AC 1.6):

SQL queries are made up of statements and clauses. The SELECT, FROM, and WHERE clauses are fundamental building blocks of SQL queries.

Use case: specify what data you want, where to find it, and how to narrow it down to what's relevant.

Data types define the kind of data that can be stored in a column, ensuring accurate storage and efficient querying.

Understanding data types ensures accuracy, optimises performance, and supports scalability by storing data efficiently and preventing errors.

SQL structure, syntax, and data types give the ability to handle and analyse data effectively.

Use case: solve real-world problems quickly and efficiently, making SQL an essential skill for data professionals.

Learning Outcome 2:

Machine learning concepts, algorithms, and applications (AC 2.1):

- Overview of supervised learning models and classification techniques.
- Decision Trees and Random Forest algorithms, and their role in decision-making processes.
- Strengths and weaknesses of classification methods in predictive analytics.
- Model evaluation metrics (accuracy, precision, recall, and F1-score) and how they impact decision-making.
- Ethical concerns in classification, including bias in datasets and challenges to interpretability.
- Business Applications: customer churn prediction, sales forecasting, fraud detection, recommendation systems, sentiment analysis, predictive maintenance

Implementing and evaluating ML models using Python (AC 2.2):

- Scikit-learn Basics: model import and instantiation, fit and predict methods, split to train and test, normalisation, pipeline creation
- Overview of unsupervised learning models and clustering techniques.
- Understanding K-Nearest Neighbours (KNN) and K-Means Clustering for Pattern Recognition. Techniques for determining the optimal number of clusters using the elbow method and silhouette analysis. Comparing hierarchical clustering and K-Means for different business scenarios.
- Practical industry applications of clustering, including customer segmentation and anomaly detection.
- Ethical challenges in clustering include the risks of biased grouping and misinterpreting clustering results.
- Evaluation Metrics:
    - Classification Metrics: accuracy score, confusion matrix, precision and recall, F1 score,
    - Regression Metrics: mean squared error (MSE), root mean squared error (RMSE), mean absolute error (MAE), R-squared score,
- Learners will engage in practical exercises to build and refine classification and clustering models using real-world datasets.
- They will analyse model outputs and interpret results to understand predictive accuracy and generalisability.
- Special emphasis will be placed on understanding bias within datasets and its impact on AI-driven predictions.
- Understand both technical and ethical considerations.

Assessment guidance:
AC1 (Learning Outcome 1): **Type of evidence:** SQL query results, Exam **Assessment criteria:** 1.1, 1.2, 1.3, 1.4, 1.5, 1.6 **Additional information:** Create an SQL database with multiple tables. Populate the table with data and then answer a series of business scenario questions using SQL queries.
AC2 (Learning Outcome 2): **Type of evidence:** Machine learning project notebook, Exam **Assessment criteria:** 2.1, 2.2 **Additional information:** In a Jupyter Notebook, create a predictive model to answer a real-world business scenario. With Python, load a dataset, prepare it, train the model, and evaluate it. Communicate why the algorithms and variables used were chosen.
AC3 (Learning Outcome 3): **Type of evidence:** Machine learning project notebook, Exam **Assessment criteria:** 3.1, 3.2 **Additional information:** Identify ethical issues in your dataset and any ethical consequences in your model predictions.
AC4 (Learning Outcome 4): **Type of evidence:** Jupyter Notebook, SQL project, Statistical project, Exam **Assessment criteria:** 4.1, 4.2, 4.3, 4.4 **Additional information:** Draw conclusions from statistical test results for Hypotheses in your stats project. Draw conclusions from the results of the ML model prediction in your Notebook. Draw conclusions based on the predictions from the ML model evaluation results. Report the results of your SQL queries.

3.2 Explanation of assessment terms used in this qualification

Term	Definition
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
Apply	Explain how existing knowledge can be linked to new or different situations or in practice
Assess	Estimate or make a judgment
Clarify	Explain the information in a clear, concise way showing depth and understanding
Classify	Organise accurately according to specific criteria
Communicate	Convey, receive or exchange spoken or written information
Compare	Examine the subjects in detail looking at similarities and differences
Create	Make, produce, bring or find through learning or creative abilit
Demonstrate	Apply skills in a practical situation and/or show detailed understanding of the topi
Describe	Provide a broad range of detailed information about the topic or item in a logical way
Design	Turn an idea into a practical solution or plan, with the goals of achieving specific objectives and satisfying user or user need
Develop	Identify, build and extend a topic, plan or idea
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 judgment; apply current research or theories to support the evaluation when applicable
Explain	Apply reasoning to account for how something is or to show understanding of underpinning concepts; responses could include examples to support the reason
Generate	Create/produce ideas
Summarise	Give the main ideas or facts in a concise way
Use	Take or apply an item, resource or piece of information as required

4. Quality Assurance

As the portfolio of evidence is assessed by the centre's assessor, the centre must operate an internal quality assurance process. This ensures that qualification standards are being applied consistently within a centre through training, standardisation, sampling of marking and feedback.

4.1 Internal quality assurance

Centres should refer to the online Centre Handbook for further guidance on staffing requirements.

A centre's internal quality assurance process is led by the Internal Quality Assurer (IQA), who is responsible for identifying and promoting best practices in teaching, learning, and assessment. They are responsible for:

- monitoring assessment practices to ensure they meet our standards.
- sampling assessment decisions and learner work to verify accuracy and consistency.
- observing assessors and tutors, providing feedback and support for improvement.
- facilitating standardisation meetings to align assessment practices across teams.
- supporting assessors with professional development and guidance.
- identifying and promoting best practices in teaching, learning, and assessment.
- handling appeals and complaints related to assessment outcomes.
- maintaining detailed records for audits and external quality assurance visits.

The portfolio of evidence is subject to internal quality assurance whereby a centre regularly samples and evaluates its assessment practices and decisions, and acts on the findings to ensure consistency and fairness.

To ensure the integrity of the internal quality assurance process, Internal Quality Assurers (IQAs) must not quality assure work that they have assessed.

Assessors must ensure fair assessment and equality of opportunity for the learner within the assessment process. In order to ensure that the assessor is making judgements that are consistent with the rest of the assessment team, they must meet regularly with other assessors and internal quality assurers to discuss assessment decisions.

4.2 Sampling

Sampling is a key element of the internal quality assurance process whereby the IQA:

- uses a risk-based approach to determine what to sample and when.
- checks the quality and consistency of each assessor's decisions.
- maintains a common standard of marking within the centre over time.
- applies methods like vertical sampling (same unit across assessors), horizontal sampling (multiple units from one learner), and diagonal sampling (across units and learners).
- ensures sampling covers all units over time, not just at the end of the assessment process.

4.3 Internal standardisation

Internal standardisation is a collaborative process by which tutors and assessors within a centre consider work that they have assessed and, using pre-determined criteria, reach a common agreement on standards as being typical of work at a particular level or grade by comparing samples and providing peer evaluation.

The process of internal quality assurance provides an opportunity for assessors to receive feedback and support, which can help improve their assessment skills. It fosters a culture of continuous improvement and professional development among teaching and assessment staff.

Standardisation will be facilitated by the Centre's IQA and should include all those involved in assessing learner evidence. Centre standardisation events should be held at regular intervals. Centres will be required to keep records of each internal standardisation event, including the date, attendees and notes on any outcomes and actions. Centres will be required to store these records securely for three years, and Gateway Qualifications may ask to see them as part of the centre's quality assurance and monitoring activities.

4.4 External quality assurance

The external quality assurance process for this qualification takes a risk-based approach where external monitoring visits are carried out to review the internal quality systems of centres against key quality standards.

External quality assurance falls into two categories, the first being the quality assurance of the centre's policies and procedures (Centre monitoring) as detailed below, with the second being external sampling of the assessment decisions at qualification level.

4.5 Centre Monitoring

Centre monitoring is undertaken by an External Quality Assurer (EQA) allocated to the centre. The EQA plays a critical role in the Gateway Qualifications approach to centre assessment standards scrutiny as they are responsible for:

- Validating the centre's procedures for delivery of qualifications and assessment.
- Completing reports for each visit with clear action points where needed.
- Carrying out an annual compliance visit.
- Risk rating centres on the above.

The EQA will carry out an initial risk assessment at the centre recognition stage and then annually on an ongoing basis and will give a high/medium/low-risk.

The EQA will arrange the annual quality monitoring visits. These visits:

- Monitor the centre's compliance with the centre recognition terms and conditions by reviewing programme documentation and meeting managers and centre staff.
- Identify any staff development needs.
- Ensure that all procedures are being complied with through an audit trail, and make sure that the award of certificates of achievement to learners is secure.

The EQA will contact the centre in advance of a visit. However, Gateway Qualifications reserves the right to undertake unannounced visits, including during assessment times.

4.6 Quality assuring centre assessment decisions

The external quality assurance process for this qualification involves a risk-based approach where sampling of assessment decisions and internal quality assurance activity to ensure that qualification standards are maintained.

An External Quality Assurer (EQA) will be allocated to the centre to sample the centre's assessment decisions, who will consider whether the sample provides evidence of the following:

- that the standard set out in the units is evidenced and assessment decisions are applied consistently.
- appropriate teaching, stimulus, support, or learning materials and resources.
- an appropriate internal quality assurance strategy and sampling plans.
- appropriate and consistent feedback provided by the assessor to the learner, and by the IQA to the assessor.

A report will be completed by the EQA and made available to the Centres once the sampling activity has been completed.

4.7 Malpractice and Maladministration

Malpractice is any deliberate activity, neglect, default or other practice that compromises the integrity of the assessment process and/or the validity of certificates. It covers any deliberate actions, neglect, default or other practice that compromises or could compromise:

- the assessment process
- the integrity of a regulated qualification
- the validity of a result or certificate
- the reputation and credibility of Gateway Qualifications
- the qualification to the public at large

Centre staff should be familiar with the Malpractice and Maladministration Policy and Procedure.

4.8 Direct claim status

Direct claim status (DCS) is a status given to centres on an individual qualification basis and allows centres to claim certification without waiting for an external quality assurance activity to take place.

DCS is permitted for this qualification. Refer to the Direct Claims Status page for further details.

4.9 Recognition of prior learning

Recognition of Prior Learning enables recognition of achievement from a range of activities through the knowledge, understanding or skills that learners already possess and so do not need to develop these through a course of learning.

The use of RPL is permitted for this qualification.

4.10 Reasonable adjustments and special considerations

Reasonable adjustments are centre permitted, for details on this Centres should refer to the Reasonable Adjustments and Special Considerations Centre Guidance.

For learners who require special consideration at the point of assessment, complete a Special Consideration Request Form.

4.11 Appeals

Learners who wish to appeal about their assessment results or a decision affecting their learning should either be supported by their Centre or should have exhausted their Centre's own appeals process before appealing to Gateway Qualifications. In the latter case, learners must provide Gateway Qualifications with evidence that they have first appealed to their Centre.

Centres and learners should refer to the Appeals policy for further information.

5. Glossary of terms

This section provides a concise compilation of frequently used terms and acronyms within our organisation and the broader educational context.

Term	Definition
Guided Learning Hours (GLH)	Is the amount of direct contact time a Learner has with immediate guidance or supervision of – a lecturer, supervisor, tutor or other appropriate provider of education or training. This cannot be unsupervised study, preparation for study or time used for assessments.
Total Qualification Time (TQT)	Is the number of notional hours which represents an estimate of the total amount of time that could be reasonably expected to be required for a Learner to achieve and demonstrate the achievement of the level of attainment necessary for the award of the qualification. Total Qualification Time is comprised of the following two elements: • the number of hours which an awarding organisation has assigned to a qualification for Guided Learning, and • an estimate of the number of hours a Learner will reasonably be likely to spend in preparation, study or any other form of participation in education or training, including assessment, which takes place by – but, unlike Guided Learning, not under the Immediate Guidance or Supervision of – a lecturer, supervisor, tutor or other appropriate provider of education or training.

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