**Quantitative Methods**

This unit will enable learners to further develop understanding and skills in the application of quantitative methods appropriate to support decision-taking in organisations.

**Indicative Content**

**1. Understand the types of quantitative data which can be used by organisations to monitor and improve their performance**

- The nature of data and types of data such as qualitative and quantitative, and of information, how data can be turned into information and information used to inform decision making.

- Interpreting data from a variety of sources using different methods of analysis with advantages, disadvantages and limitations of each

- Use and comparison of sampling techniques including random sampling with and without replacement; stratified sampling; cluster sampling; systematic sampling and other types of sampling techniques

**2. Be able to analyse and evaluate raw business data to inform decision taking**

- Quantitative methods that are used to analyse and evaluate data

- Descriptive statistics:

o Measures of central tendency (e.g. mean, median)

o Measures of variability (e.g. range, standard deviation)

o Application to business data (e.g. finding average earnings, measuring)

o Variability in business processes such as queuing times and customer arrival rates

* Inferential statistics, the difference between sample and population and reliability of estimates from samples
* Measuring association:

o Use of scatter plots, correlation and regression analysis (linear), simple forecasting

* 1. o Business applications such as the association between output and cost, advertising and sales
	2. o Evaluating use of software such as Excel and SPSS to perform raw data analysis

**3. Be able to apply a range of quantitative methods to support effective business decision taking**

- Probability distributions and application to business decisions, Normal distribution (e.g. weights and measures regulations and statistical process control), Poisson distribution (e.g. customer arrival rates) and binomial distribution (e.g. inspection sampling), Inference (e.g. margins of error and confidence limits)

- Inventory management including optimum inventory and economic order quantities

capacity management and factors effecting capacity and maximum output rates, forecast capacity and the use of decision trees

* The issue of variability in business processes (e.g. arrival rates of customers and time taken to deal with customers), and how this leads to a trade-off between waiting time and process utilisation
* Quantitative methods used to analyse trends over time such as time series analysis and index numbers and how they support planning and decision making

**4. Be able to report on data and communicate findings to support decision taking**

- Identifying data: numerical, both discrete and continuous; Categorical data -nominal or ordinal

- Levels of measurement - nominal, ordinal, interval, ratio

* Centre, and spread of data, ordering, frequency and scatter plots, ranking.
* Levels of measurement - nominal, ordinal, interval, ratio
* Time series analysis, indices, histograms, charts, tables, bar and line graphs and their use in representing and interpreting data
* Choosing the most effective ways analysing data and of communicating the results of the analysis and information for decision taking using tables and charts with appropriate limitations conclusions and recommendations given
* Utilising Software for producing charts/tables