



# Introduction to Quantitative Methods

---

|                          |                      |
|--------------------------|----------------------|
| <b>ABE unit code</b>     | 4UIQM                |
| <b>Ofqual code</b>       | Y/615/7465           |
| <b>Unit type</b>         | Mandatory            |
| <b>Level</b>             | 4                    |
| <b>Credits</b>           | 15                   |
| <b>GLH</b>               | 75                   |
| <b>Assessment method</b> | Timed Open Book Exam |

Quantitative skills are seen as indispensable for aspiring managers and entrepreneurs. Numbers make their presence felt in a range of managerial tasks across all functions of an enterprise. The focus of the Quantitative Methods syllabus is to:

- Develop quantitative thinking and skills
- Develop skills in gathering and computing numbers
- Cultivate the ability to present, interpret and communicate quantitative results for managerial decision making
- Build a robust quantitative foundation for other business units

Quantitative skills built at this level will help you to apply a number of concepts in other core areas of business management: marketing, accounting, finance, and human resource management. Many decisions in these areas require quantitative skills, for example calculating the sales volume for recovering costs, determining the price of a new product, estimating demand for the product, measuring the overall performance of the business etc.

## What you'll learn

The table below shows the learning outcomes of this unit (what you will be able to do or what you will know), along with the assessment criteria (what you will be able to do to demonstrate achievement of the learning outcome).

| Learning Outcomes<br><i>The learner will:</i>   | Assessment Criteria<br><i>The learner can:</i>  | Weighting |
|---|---|-----------|
| 1. Apply numeracy and quantitative techniques for use in day-to-day business activities | 1.1 Perform calculations on different types of numbers<br>1.2 Express numbers in various forms for making comparisons<br>1.3 Perform simple financial calculations to obtain values for taking business decisions   | 20%       |
| 2. Apply algebraic methods to formulate and solve business problems                     | 2.1 Solve or simplify equations by employing algebraic methods<br>2.2 Derive the equation of a straight line to show relationship between variables   | 20%       |
| 3. Discuss the process of gathering business and management data                        | 3.1 Explain main sources, types, and uses of data relevant for business and management information<br>3.2 Evaluate alternative methods of sampling and measurement scales used in context of business information<br>3.3 Classify and tabulate statistical data   | 30%       |
| 4. Analyse data using statistical tools and interpret the results                       | 4.1 Construct and interpret appropriate charts and diagrams from tabular data<br>4.2 Employ a set of descriptive statistics for analysis and interpretation of grouped and ungrouped data<br>4.3 Determine correlation between two business variables<br>4.4 Perform linear regression to make business forecasts | 30%       |

## Capabilities

Alongside academic learning and development, ABE qualifications have been designed to develop your practical skills and capabilities. These capabilities are highlighted as certain values, knowledge, skills, and behaviours that will help you in your professional development.

Below is an overview of the behaviours, skills, and attitudes that you will develop through this unit:

| Element of learning                                    | Key capabilities developed  |
|--|---|
| <b>Element 1 - Numeracy for business</b>               | Apply numerical techniques in context typical business situations<br><i>Problem posing and problem-solving using arithmetic, numeracy, application of mathematical formulas</i>   |
| <b>Element 2 - Algebraic methods</b>                   | Use algebraic methods to express relationship between variables and find their values.<br><i>Problem posing and problem-solving using algebra, mapping and presenting relationships between variables</i><br>Plot and interpret mathematical graphs<br><i>Visual presentation and analysis of information</i> |
| <b>Element 3 - Business statistics</b>                 | Assessing data with the application of statistical techniques to gain insight into real world business environment<br><i>Planning research, creative data collection, analysing and interpreting data, presenting information</i>   |
| <b>Element 4 - Statistical tools and data analysis</b> | Employing statistical techniques to interpret data and communicate quantitative results for managerial decision making<br><i>Application of statistical tools, data analysis and synthesis, presentation of information, creative interpretation for evaluation</i>   |

## Localisation

It is very important when studying for your ABE qualification that you consider your local business environment and try to apply what you are learning to relevant scenarios in your local business context. Doing this will help you to put your learning into practice and use it in your professional day-to-day activities.

You need to appreciate that numbers have a universal appeal. Organisations make use of numbers to reduce ambiguity when taking decisions in almost all business functions. For these reasons, quantitative skills are important for employability. When preparing for assessment in Quantitative Methods you should make a careful note of the points below:

- A candidate with quantitative skills is capable of reasoning, critical thinking, problem solving, forecasting, and decision making. These abilities equip you to perform effectively either as an employee or an entrepreneur without being affected by local culture, customs or regulations.
- Quantitative skills are transferable skills and therefore you can apply them in a wide range of industries and all types of organisations – big or small, local or global, profit driven or not-for-profit, world over.
- It can be safely assumed that, unlike soft skills such as communication and negotiation, the character of quantitative skills is not easily influenced by the culture and economy of a country. Local organisations may be prolific users of numerical and statistical techniques, and just like any typical multinational corporation, may include numeracy as one of the key competencies in the recruitment and selection process. Therefore, it may be the culture of the organisation – and not whether the organisation is local or global – that could determine the extent to which quantitative skills will be applied for problem solving, analysis, planning, and decision-making.

It is recommended that you become familiar with a non-programmable scientific calculator.

# Indicative Content

---

## 1. Apply numeracy and quantitative techniques for use in day-to-day business activities (Weighting 20%)

### 1.1 Perform calculations on different types of numbers

- Application of rules of numeracy to whole numbers, integers, fractions, decimals
- Conversion of fractions into decimals or decimals into fractions

### 1.2 Express numbers in various forms for making comparisons

- Expression of numbers in standard form  $A \times 10^n$ , where  $1 \leq A < 10$  and  $n$  is an integer
- Expression of a number as a percentage of another number
- Comparison of numbers using ratios and proportions

### 1.3 Perform simple financial calculations to obtain values for taking business decisions

- Calculation of simple interest and compound interest
- Computation of discounted and present value of money
- Calculating the depreciation of an asset using the straight line method and the reducing balance method
- Calculation of wages, discounts, taxation, foreign currency conversions

---

## 2. Apply algebraic methods to formulate and solve business problems (Weighting 20%)

### 2.1 Solve or simplify equations by employing algebraic methods

- Use of a sequence of operations and brackets to evaluate algebraic expressions
- Solve a single variable linear equation
- Solve simultaneous linear equations in two variables
- Solve quadratic equations by using factorisation and quadratic equation formulae

### 2.2 Derive the equation of a straight line to show relationship between variables

- Ascertain the gradient and intercept of an equation for a straight line
- Determine the equation of a straight line given its gradient and its y- intercept
- Determine the equation of a straight line given its gradient and one point lying on it
- Determine the equation of a straight line given two points lying on it

---

### 3. Discuss the process of gathering business and management data (Weighting 30%)

#### 3.1 Explain main sources, types, and uses of data relevant for business and management information

- Primary and secondary sources of data for a business
- Differences between primary and secondary data, quantitative and qualitative data, and continuous and discrete data
- Use of data in day-to-day business activities

#### 3.2 Evaluate alternative methods of sampling and measurement scales used in context of business information

- Differences between random and non-random sampling techniques
- Types of random and non-random sampling techniques
- The concept of sampling error and bias
- Differences between nominal, ordinal, interval, and ratio measurement scales in statistics

#### 3.3 Classify and tabulate statistical data

- Rules for tabulation
- Simple tables and two-way tables
- Concepts of class interval, class boundary
- Frequency distributions: simple, grouped, cumulative, and relative

---

### 4. Analyse data using statistical tools and interpret the results (Weighting 30%)

#### 4.1 Construct and interpret appropriate charts and diagrams from tabular data

- Drawing and interpreting charts and graphs for qualitative data, including bar charts and pie charts
- Drawing and interpreting charts and graphs for quantitative data, including histograms, frequency curves, cumulative frequency graphs (ogives), stem and leaf diagrams

#### 4.2 Employ a set of descriptive statistics for analysis and interpretation of grouped and ungrouped data

- Use of appropriate measures of central tendency (mean, median, and mode)
- Use of measures of dispersion to determine the spread of data (range, inter-quartile range, quartile deviation, and standard deviation)
- Differences between symmetrical and skewed distribution
- Calculation of Karl Pearson's coefficient to measure extent of skewness

#### 4.3 Determine correlation between two business variables

- Use of scatter diagram to identify relationship between two business variables
- Measurement and interpretation of the degree of relationship between linear related variables using Pearson's coefficient measure or Spearman's rank correlation measure

#### 4.4 Perform linear regression to make business forecasts

- Determining the simple linear regression equation for a two-variable model using least squares method
  - Use of regression equation to estimate the value of one variable corresponding to another variable
-