

## BUSINESS MATHEMATICS AND STATISTICS

**UNIT CODE:** BUS/CU/AC/CR/02/6

### Relationship to Occupational Standards

This unit addresses the unit of competency: Carry Out Business Mathematics Statistics

**Duration of Unit:** 140 hours

### Unit Description

This unit specifies the competencies required to carry out business mathematics and statistics. It involves carrying out statistical equations, carrying out statistical matrices, preparing commercial mathematics, performing elementary statistics, carrying out descriptive statistics, applying set theory, applying basic probability theory and determining index numbers.

### Summary of Learning Outcomes

1. Carry out statistics equations
2. Carry out statistical matrices
3. Prepare commercial mathematics
4. Perform elementary statistics
5. Carry out descriptive statistics
6. Apply set theory
7. Apply basic probability theory
8. Determine index numbers

### Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Carry out statistical equations	<ul style="list-style-type: none"><li>• Linear equations; solving and graphs</li><li>• Quadratic equations; solving and graphs</li><li>• Differentiation</li><li>• Simultaneous equations; solving</li><li>• Break-even analysis</li><li>• Total revenue, total cost and profit equations; application of errors</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Observation</li><li>• Oral questions</li><li>• Third party report</li><li>• Interviewing</li><li>• Project and report writing</li></ul>
2. Carry out statistical matrices	<ul style="list-style-type: none"><li>• Introduction: order, types</li><li>• Addition, subtraction and multiplication</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Observation</li><li>• Oral questions</li></ul>

	<ul style="list-style-type: none"> <li>• Determinants of 2x2 matrices</li> <li>• Inverses of 2x2 matrices</li> <li>• Application of matrices to business problems</li> </ul>	<ul style="list-style-type: none"> <li>• Third party report</li> <li>• Interviewing</li> <li>• Project and report writing</li> </ul>
3. Prepare Commercial mathematics	<ul style="list-style-type: none"> <li>• Buying and selling; discounts, profit and loss, margins and mark-ups</li> <li>• Commissions and salaries; piece and hourly rates, gross and net pay, PAYE</li> <li>• Bills calculations; water and electricity</li> <li>• Simple and compound interest</li> <li>• Depreciation and appreciation of assets</li> <li>• Hire purchase</li> <li>• Foreign currency exchange transactions</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> <li>• Interviewing</li> <li>• Project and report writing</li> </ul>
4. Perform Elementary statistics	<ul style="list-style-type: none"> <li>• Introduction: definitions and branches of statistics</li> <li>• Methods of data collection: primary and secondary data</li> <li>• Sampling techniques</li> <li>• Presentation of data: <ul style="list-style-type: none"> <li>○ Tables</li> <li>○ Diagrams: bar charts and pie charts</li> <li>○ Graphs: basic time series graphs, Z-charts, Lorenz curves and semi log graphs</li> <li>○ Frequency distribution tables</li> <li>○ Histogram and frequency polygons</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> <li>• Interviewing</li> <li>• Project and report writing</li> </ul>

	<ul style="list-style-type: none"> <li>○ Cumulative frequency curve (ogive) and its application</li> </ul>	
5. Carry out Descriptive statistics	<ul style="list-style-type: none"> <li>□ Measures of central tendency: <ul style="list-style-type: none"> <li>○ Mean: arithmetic mean, weighted arithmetic mean, geometric mean and harmonic mean</li> <li>○ Mode</li> <li>○ Median</li> </ul> </li> <li>• Measures of dispersion: range, quartile, deciles, percentiles, mean deviation, standard deviation and coefficient of variation</li> <li>• Measures of skewness and kurtosis excluding computation of the</li> <li>• coefficients</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> <li>• Interviewing</li> <li>• Project and report writing</li> </ul>
6. Apply Set theory	<ul style="list-style-type: none"> <li>• Introduction to set theory</li> <li>• Types of sets: universal, empty/null, subsets, finite and infinite</li> <li>• Operation of sets: unions, intersections, complements and set difference</li> <li>• Venn diagrams</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> <li>• Interviewing</li> <li>• Project and report writing</li> </ul>
7. Apply Basic probability theory	<ul style="list-style-type: none"> <li>• Introduction to probability: definitions, events, outcomes, sample space</li> <li>• Types of events: simple, compound, independent, mutually exclusive,</li> <li>• mutually inclusive, dependent events</li> <li>• Rules of probability: additive and multiplicative rules</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> <li>• Interviewing</li> <li>• Project and report writing</li> </ul>

	<ul style="list-style-type: none"> <li>• Baye's Theorem</li> <li>• Elementary probability trees</li> </ul>	
8. Determine Index numbers	<ul style="list-style-type: none"> <li>• Construction of index numbers</li> <li>• Purpose of index numbers</li> <li>• Simple index numbers; fixed base method and chain base method</li> <li>• Consumer Price Index (CPI)</li> <li>• Weighted index numbers; Laspeyre's, Paasche's, Fisher's ideal and</li> <li>• Marshall- Edgeworth's methods (both price and quantity index numbers)</li> <li>• Limitations of index numbers</li> <li>• Emerging issues and trends</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> <li>• Interviewing</li> <li>• Project and report writing</li> </ul>

### Suggested Methods of Instruction

- Project
- Demonstration by trainer
- Practice by the trainee
- Discussions
- Direct instruction
- Case study
- Audio –visual aids

### Recommended Resources

- Printers,
- Computer,
- Calculator,
- Computer software's,
- Internet connectivity,
- Paper shredders,
- Photocopiers,
- Printers, scanners,

- Stationery

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