

## QUANTITATIVE TECHNIQUES

**UNIT CODE:** BUS/CU/AC/CC/03/6

### **Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply Principles of Quantitative Techniques

**Duration of Unit:** 140 hours

### **Unit Description**

This unit specifies the competencies required to apply principles of quantitative techniques. It involves carrying out quantitative techniques, applying correlation and regression analysis, formulating linear programming models, carrying out operational matrices, applying time series, analysing project networks, applying calculus, formulating inventory control models, determining probability and probabilistic distribution and testing hypothesis.

### **Summary of Learning Outcomes**

1. Carry out quantitative techniques
2. Apply correlation and regression
3. Formulate linear programming models
4. Carry out operational matrices
5. Apply time series
6. Analyse project networks
7. Apply calculus
8. Formulate inventory control models
9. Determine probability and probabilistic distribution
10. Testing hypothesis

### **Learning Outcomes, Content and Suggested Assessment Methods**

<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Methods</b>
1. Carry out quantitative techniques	<ul style="list-style-type: none"><li>• Meaning of terms</li><li>• Development of quantitative techniques</li><li>• Role of quantitative techniques in business and industry</li><li>• Types of quantitative techniques</li><li>• Areas where quantitative techniques are applicable</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>

<p>2. Apply correlation and regression</p>	<ul style="list-style-type: none"> <li>• Meaning of terms</li> <li>• Differences and similarities between correlation and regression analysis</li> <li>• Methods of calculating correlation</li> <li>• Interpretation of correlation coefficient</li> <li>• Methods of calculating regression</li> <li>• application of regression analysis</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>
<p>3. Formulate linear programming models</p>	<ul style="list-style-type: none"> <li>• Meaning of terms</li> <li>• Assumptions of linear programming models</li> <li>• Formulation of linear programming model</li> <li>• Solving linear programming problems</li> <li>• Application of linear programming</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</li> </ul>
<p>4. Carry out operational matrices</p>	<ul style="list-style-type: none"> <li>• Meaning of terms</li> <li>• Types of matrices</li> <li>• Determinants of order of a matrix (2*2 and 3*3)</li> <li>• Inverse of a matrix</li> <li>• Application of matrices</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>
<p>5. Apply time series</p>	<ul style="list-style-type: none"> <li>• Meaning of terms</li> <li>• Objectives of time series analysis</li> <li>• Components of time series analysis</li> <li>• Application of time series</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. Analyse project networks	<ul style="list-style-type: none"> <li>• Meaning of terms</li> <li>• Rules applicable when drawing networks</li> <li>• Construction of project network</li> <li>• Critical path and project duration</li> <li>• Application of network analysis</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 calculus	<ul style="list-style-type: none"> <li>• Meaning of terms</li> <li>• Differentiation of simple functions</li> <li>• Integration of simple functions</li> <li>• Application of calculus</li> <li>•</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>
8. Formulate inventory control models	<ul style="list-style-type: none"> <li>• Meaning of terms</li> <li>• Setting Inventory control levels</li> <li>• Minimization of cost of inventories</li> <li>• Inventory control models</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>
9. Determine probability and probabilistic distribution	<ul style="list-style-type: none"> <li>• Meaning of terms</li> <li>• Basic concepts of probability</li> <li>• Laws of probability</li> <li>• Probability distribution</li> <li>• Application of probability distribution functions</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>
10. Test hypothesis	<ul style="list-style-type: none"> <li>• Meaning of terms</li> <li>• Types of hypothesis</li> <li>• Type 1 and 2 errors</li> <li>• Critical and acceptance regions</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>

	<ul style="list-style-type: none"> <li>• Z-test and T-test</li> <li>• Emerging issues</li> </ul>	<ul style="list-style-type: none"> <li>• Interviewing</li> <li>• Project and report writing</li> </ul>
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### **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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