

## RESEARCH METHODS

**UNIT CODE:** MATH/CU/AS/CC/03/6/A

### Relationship to Occupational Standards

This unit addresses the unit of competency: Apply Research methods

**Duration of Unit:** 130 hours

### Unit Description

This unit covers the competencies required to carry out statistical data management. It involves formulating the research problem, carry out literature review, develop research objectives, develop research design and sample design, develop research budget proposal & time plan, collect research data, analyse collected research data, interpret findings and present findings

### Summary of Learning Outcomes

1. Formulating the Research Problem
2. Carry out Extensive Literature Review
3. Develop research objectives
4. Develop Research Design and Sample Design
5. Develop research budget proposal & Time plan
6. Collecting research Data
7. Analysis of collected research Data
8. Interpretation, Research Findings
9. Present research findings

### Learning Outcomes, Content and Suggested Assessment Methods

Learning outcome	Content	Suggested assessment methods
1. Formulating the Research Problem	<ul style="list-style-type: none"><li>• Sources of research problems</li><li>• Definition of research Philosophies</li><li>• validity and reliability</li><li>• Characteristics of research</li><li>• Types of research</li><li>• The research processes</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Oral questioning</li><li>• Assignments</li><li>• Supervised exercises</li></ul>

	<ul style="list-style-type: none"> <li>• Sources of research problems</li> <li>• Formulation of research problems</li> </ul>	
2. Carry out Literature review	<ul style="list-style-type: none"> <li>• Reviewing the literature</li> <li>• Sources of literature review</li> <li>• Theoretical framework</li> <li>• Conceptual framework</li> <li>• Referencing and citations</li> <li>• Introduction to Google scholar, research gate</li> <li>• Internet search engines</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Oral questioning</li> <li>• Assignments</li> <li>• Supervised exercises</li> </ul>
3. Develop research objectives/hypothesis or research questions	<ul style="list-style-type: none"> <li>• Formulation of objectives</li> <li>• main objectives</li> <li>• sub-objectives</li> <li>• characteristics of objectives</li> <li>• characteristics of research hypothesis</li> <li>• formulation of research hypothesis</li> </ul>	<ul style="list-style-type: none"> <li>• Assignments</li> <li>• Oral questioning</li> <li>• Supervised exercises</li> <li>• Written tests</li> </ul>
4. Develop Research Design and Sample Design	<ul style="list-style-type: none"> <li>• Preparing the research design</li> <li>• Identifying Variables</li> <li>• Measurement scales</li> <li>• Study research design <ul style="list-style-type: none"> <li>• observational</li> <li>• interventional</li> </ul> </li> <li>• Types of Sampling techniques <ul style="list-style-type: none"> <li>• Probability and non-probability</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Oral questioning</li> <li>• Assignments</li> <li>• Supervised exercises</li> </ul>

	<ul style="list-style-type: none"> <li>• Sample size determination</li> </ul>	
5. Develop research budget proposal & Time plan	<ul style="list-style-type: none"> <li>• Budget and Costing Development <ul style="list-style-type: none"> <li>• Direct costs</li> <li>• Indirect costs</li> </ul> </li> <li>• Factors to consider when costing <ul style="list-style-type: none"> <li>• Materials and equipment</li> <li>• Logistics</li> <li>• Administrative</li> </ul> </li> <li>• Development of Time plan <ul style="list-style-type: none"> <li>• Gant charts</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Written test</li> <li>• Observation</li> <li>• Third party report</li> <li>• Oral questioning</li> <li>• Interviews</li> </ul>
6. Collect research Data	<ul style="list-style-type: none"> <li>• Methods of Data Collection and their limitations</li> <li>• Research instruments/ data collection tools</li> <li>• Types of questionnaires</li> <li>• Design of questionnaires</li> <li>• Constructing questionnaires</li> <li>• Digitising questionnaires <ul style="list-style-type: none"> <li>• Mobile technology (ODK)</li> </ul> </li> <li>• Piloting the Questionnaire</li> <li>• Ethical issues concerning research participants</li> <li>• Ethical issues relating to the researcher</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Oral questioning</li> <li>• Assignments</li> <li>• Supervised exercises</li> </ul>
7. Analyse collected research data	<ul style="list-style-type: none"> <li>• Data Processing</li> <li>• Data management.</li> <li>• Data Analysis Methods</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Oral questioning</li> <li>• Assignments</li> </ul>

		<ul style="list-style-type: none"> <li>Supervised exercises</li> </ul>
8. Interpret research findings	<ul style="list-style-type: none"> <li>Interpretations of parameters</li> <li>Predicting of values</li> </ul>	<ul style="list-style-type: none"> <li>Written tests</li> <li>Oral questioning</li> <li>Assignments</li> <li>Supervised exercises</li> </ul>
9. Present of findings	<ul style="list-style-type: none"> <li>reporting of findings</li> <li>Research Project Report Format</li> <li>List of References /Bibliography</li> </ul>	<ul style="list-style-type: none"> <li>Written tests</li> <li>Oral questioning</li> <li>Assignments</li> <li>Supervised exercise</li> </ul>

### Suggested Methods Instructions

- Group discussions
- Demonstration by trainer
- Exercises by trainee
- Use of teaching aids

### Recommended Resources

- Charts with presentations of data
- Dice
- Computers with internet connection
- Datasets
- Projector
- Statistical Software
- Notes