BASIC MATHEMATICS FOR SCIENCE

UNIT CODE: 0541 441 06A

TVET CDACC UNIT CODE: SLT/CU/SL/CC/03/5/MA

UNIT DURATION: 120 Hours

Relationship to Occupational Standards

This unit addresses the unit of competency: Apply Basic Mathematics for science.

Duration of Unit: 120 hours

Unit Description

This unit specifies the competencies required to apply fundamental mathematical techniques. It involves applying basic arithmetic operations, solving algebraic equations and expressions, performing vector operations, using trigonometric principles, and applying statistical methods.

Summary of Learning Outcomes

By the end of this unit, the learner should be able to:

S/No	Learning Outcomes	Duration (Hours)
1.	Apply basic arithmetic operation	10
2.	Apply algebraic equation and expression	10
3.	Apply vectors	10
4	Apply trigonometry	50
5	Apply statistical methods	40
	Total	120

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Apply basic arithmetic operation	1.1.Addition and subtraction on; 1.1.1 Natural numbers 1.1.2 Integers 1.1.3 Fractions	• Practical • Project • Third party report • Portfolio of

	1.1.4 Decimals 1.2.Multiplication and division on; 1.2.1 Natural numbers 1.2.2 Integers 1.2.3 Fractions 1.2.4 Decimals 1.3.Ratios, proportions and percentages 1.3.1 Direct proportion 1.3.2 Inverse proportion 1.4.Indices 1.4.1 Bases 1.4.2 Laws of indices 1.4.3 Indicial equations	evidence • Written test • Oral test
2. Apply algebraic equation and expression	2.1 Solution of linear equations 2.2 Solution of simultaneous 2.2.1 Elimination method 2.2.2 Substitution method 2.2.3 Graphical method 2.3 Linear graphs 2.3.1. Co-ordinates 2.3.2. Plotting of points 2.3.3. Graphs of straight lines 2.4 Solution of quadratic equations 2.4.1 Factorization 2.4.2 Completing square method 2.4.3 Quadratic formula	• Practical • Project • Third party report • Portfolio of evidence • Written test • Oral test
3. Apply vectors	3.1 Introduction to vectors 3.1.1 Definition of vectors 3.1.2 Vector quantities 3.1.3 Scalar quantity 3.2 Vectors addition 3.3 Vectors subtraction 3.4 Vectors multiplication 3.5 Position of vectors 3.5.1 Modulus of a vector	• Practical • Project • Third party report • Portfolio of evidence • Written test • Oral test
4. Apply trigonometry	4.1 Pythagoras theorem 4.2 Trigonometric ratios 4.2.1 Sine 4.2.2 Cosine 4.2.3 tangent 4.3 Trigonometric operations 4.3.1 Trigonometric identities 4.3.2 Trigonometric equations 4.3.3 Sine rule	• Practical • Project • Third party report • Portfolio of evidence • Written test • Oral test

	4.3.4 cosine rule 4.3.5 Tangent rule 4.4 Angles of elevation and depression	
5. Apply statistical methods	5.1 Collection of raw data 5.1.1 Ungrouped data 5.1.2 Grouped data 5.2 Data presentation 5.2.1 Pictograms 5.2.2 Histograms 5.2.3 Pie charts 5.2.4 Bar charts 5.2.5 Frequency polygon 5.3 Processing of raw data 5.4 Measures of central tendency 5.4.1 Mean 5.4.2 Mode 5.4.3 Median	• Practical • Project • Third party report • Portfolio of evidence • Written test • Oral test

Suggested Delivery Methods

- Practical
- projects
- Group discussions
- Demonstration
- Direct instruction

Recommended Resources for 25 trainees

S/No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
A	**Learning Materials**			
1.	Power point presentations	For trainer's use	1	1:25
B	**Learning Facilities & infrastructure**			
2.	Lecture room	For training	1	1:25
C	**Tools and Equipment**			
3.	Computer	For trainer's use	1	1:25
4.	Scientific calculator	For trainee's use	25	1:1
5.	Projector	For trainer's use	1	1:25
6.	Graph book	For trainee's use	25	1:1
6.	SMP Mathematical table	For trainee's use	25	1:1

7.	White board ruler	For trainer's use	1	1:25
8.	White board compass	For trainer's use	1	1:25
9.	White board protractor	For trainer's use	1	1:25
10.	Geometrical set	For trainee's use	25	1:1