32.3.0 MATHEMATICS III

32.3.1 Introduction

This module unit is designed to equip the trainee with the relevant mathematical knowledge, skills, techniques and attitudes necessary to enhance better understanding of the respective trade area.

32.3.2 General Objectives

By the end of the module unit, the trainee should be able to:

a) use mathematical concepts and techniques in solving problems related to respective trade area
b) organise, draw simple deductions and conclusions from a given data
c) interpret graphical representation of functions relevant to the respective trade area

32.3.3 Module Unit Summary and Time Allocation – (77 Hours)

Code	Sub-Module Units	Content	Total Hours
32.3.01	Numerical Methods	• Definition of Interpolation and Extrapolation • Application of Interpolation and Extrapolation • Interactive Methods • Application of Interative Methods	18
32.3.02	Matrices	• Definition and Notation • Operations on Matrices • Matrix Transpose • Identity Matrix • Determinants and Inverse of 2 x 2 Matrix • Determinants and Universe Of 3 x 3 Matrix • Solution of Linear Simultaneous Equation in 2 and 3 Unknowns	18

32.3.03	Probability II	• Expectations, Variance and Standard Derivations D • Distribution Functions	20
32.3.04	Statistics II	• Standardization • Standard normal table • Mean of a sample • variance • normal statistics • t-distribution • unbiased estimate • confidence interval • types of error definition • determination of type I error • type II error definition • determination of type II error • bivariate distributions • product moment correlation coefficient • rank correlation co-efficient • linear regresion	21
		Total	77

32.3.01 NUMERICAL METHODS

32.3.01T0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
a) define interpolation and extrapolation
b) apply interpolation and extrapolation
c) state the iterative methods
d) apply iterative methods to solve problems

32.3.01C *Competence*
The trainee should have the ability to:
i) apply interpolation and extrapolation
ii) apply interactive methods to solve problems

Content

32.3.01T1 Definition of interpolation and extrapolation
32.3.01T2 relative methods
32.3.01T3 Application of iterative methods
- Newton Gregory
- Newton Raphson
- Application of iterative methods

32.3.01T4 Application of iterative method
- approximations

32.3.02 MATRICES

32.3.02T0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
a) define matrix
b) state the different notation of matrices
c) find the determinant matrix
d) find the trapose of a matrix
e) find the inverse of a matrix
f) find the identity matrix
g) apply matrixes to solve simultaneous equations

32.3.02C *Competence*
The trainee should have the ability to:
i) find the determinant matrix, trapeze of a matrix and inverse of the matrix
ii) apply matrices to solve simultaneous equations

Content

32.3.02T1 Matrix definition
32.3.02T2 Matrix notation
32.3.02T3 Inverse of a square matrix
- 2 x 2 matrix
- 3 x 3 matrix

32.3.02T4 Solution of linear simultaneous equations
- with two unknowns

- with three unknowns
-The determinant, 2 x 2, 3 x 3 matrix
-The trapose; 2 x 2, 3 x 3 matrix

32.3.02T5 The inverse: 2 x 2, 3 x 3 matrix

32.3.02T6 The identity matrix: 2 x 2, 3 x 3

32.3.02T7 Solution of imultaneous equations; 2 unknowns, 3 unknowns

32.3.03 PROBABILITY II

32.3.03T0 *Specific Objectives*

By the end of the sub-module unit, the trainee should be able to:

a) determine expectations
b) determine variance and standard deviation
c) identify discrete probability distribution
d) identify continuous probability distributions
e) identify continuous probability distributions
f) apply probability

32.3.03C *Competence*

The trainee should have the ability to:

i) determine variance and standard

variance and standard deviation
ii) identify probability distribution
iii) apply probability

Content

32.3.03T1 Expectation of x

32.3.03T2 Variance and Standard deviation

32.3.03T3 Discrete probability distribution
- binomial
- Poisson

32.3.03T4 Continuous Probability distribution

32.3.04T5 continuous probability density functions (pdfs)
- normal distribution

32.3.03T6 Application of probability
- buying materials/machinery
- utilizing machines
- quality machines
- quality control

32.3.04 STATISTICS II

32.3.04T0 *Specific Objectives*

By the end of the sub-module unit, the trainee should be able to:

a) standardize values of a normal distribution
b) use standard normal distribution tables

c) obtain the mean of a sampling distribution
d) obtain the variance of a sampling distribution
e) determine the normal statistic
f) determine the t–statistic
g) determine the unbiased estimate of a population parameters
h) determine confidence intervals for large samples
i) determine confidence intervals for small samples
j) define type I error
k) determine type I error
l) define type II error
m) determine type II error
n) determine product-moment correlation coefficient
o) determine rank correlation coefficient
p) calculate linear regression lines

32.3.04C *Competence*

The trainee should have the ability to:

i) standardize values of a normal distribution
ii) determine the t-static
iii) test hypotheses using large samples
iv) plot a scatter diagram for a bivariate distribution

Content

32.3.04T1	Standardization
32.3.04T2	Standard normal tables
32.3.04T3	Mean of a sampling distribution
32.3.04T4	Variance of a Sampling distribution
32.3.04T5	normal statieties
32.3.04T6	t-distribution
32.3.04T7	The un-biased estimate
32.3.04T8	Confidence intervals, Large samples
32.3.04T9	Confidence intervals Small samples
32.3.0410	type I error definition
32.3.04T11	Determination type I error
32.3.04T12	Type II error defination
32.3.04T13	Determination of Type II error
32.3.04T14	Bivariate distributions
32.3.04T15	Product moment Correlation coefficient
32.3.04T16	Rank correlation coefficient
32.3.04T17	Linear regression

Suggested Teaching/Learning Methods

- Lectures
- Group discussions

- Demonstration of supports

Suggested *Teaching/Learning Resources*

- Textbooks
- Supports
- Building defects
- Tables
- Charts

Suggested Assessment Methods

- Oral
- Written
- Reports
- Practical work

Tools and Equipment

- Calculators
- Computers