NATIONAL VOCATIONAL TRAINING INSTITUTE

TESTING DIVISION

TRADE TESTING REGULATIONS AND SYLLABUS

TRADE: BUILDING DRAUGHTSMANSHIP

LEVEL: CERTIFICATE ONE

BUILDING DRAUGHTSMANSHIP

CERTIFICATE ONE

A. INTRODUCTION

i. The review of this syllabus has been generally influenced by the demands of industries due to its continuous change as a result of technological advancement and the changing needs of society. It was also influenced by the TVET reforms under the directions of the new educational reforms with the view to opening up further education and training opportunities to TVET graduates.

The certificate ONE syllabus is designed to respond to the following level descriptors:

QUALIFICATION	KNOWLEDGE LEVEL	SKILLS AND ATTITUDE:
Certificate 1	1. To demonstrate a broad knowledge base incorporating some technical concepts. 2. To demonstrate knowledge of the theoretical basis of practical skills. 3. To demonstrate knowledge in numeracy, literally, IT and Entrepreneurial skills	1. Require a wide range of technical skills 2. Are applied in a variety of familiar and complex contexts with minimum supervision. 3. Require collaboration with others in a team

ii. Knowledge in the safe use of welding tools, equipment, materials, pipes, sheet metals, thick metals, fabrication of basic structures. Heat source (Chemical and Electrical) arc and gas welding, trade drawing, trade science and calculation.

B. THE GENERAL OBJECTIVES

The prime objectives of the programme is to:

- provide the knowledge, skills and attitudes in cooking craft and vocational education training that will best meet the needs of the hospitality industry;
- develop positive attitudes towards the application of practicals skills, safe use of tools, judicious of materials and time in the kitchen, proper care and maintenance of tools and equipment.

C. THE COURSE COMPONENTS

a) Trade Theory
b) Trade Science and Calculation
c) Trade Drawing
d) General Paper`
e) Trade Practical

EXAMINATION: The candidates would be examined in the FIVE components listed in 'C' above.

Practical work must be carefully planned to illustrate application of the theory and to provide maximum opportunity for workshop practice, laboratory work and demonstration.

D. KNOWLEDGE AND SKILLS REQUIREMENT

The prime objective of the program is to provide knowledge and skills of the trade in manner that will best meet the needs of the trade as well as the industries .

E. ELIGIBILITY FOR ENTRY TO EXAMINATION

Candidates may enter for examination only as internal candidate; that is those who at the time of entry to the examination are undertaking (or) have already completed the course at an approved establishment.

F. EXTERNAL EXAMINERS

The practical work of candidates will be assessed by an external examiner appointed by the Trade Testing Commissioner.

G. EXAMINATION RESULTS AND CERTIFICATES

Each candidate will receive record of performance given the grade of performance for the components Taken. These are:

i) Distinction
ii) Credit
iii) Pass
iv) Referred/Fail
v)

Certificates would be issued to candidates who pass in all the components.

NOTE:

All Technical and Vocational trainees who aspire to take advantage of the opportunities opened to them in the educational reforms should NOTE that, for a trainee to progress to certificate Two (2) a pass in Certificate One (1) is compulsory.

H. APPROVAL OF COURSE

Institutions or other establishments intending to prepare trainees for the Examination must apply to:

THE COMMISSIONER
TESTING DIVISION
NVTI HEAD OFFICE
P. O. BOX MB 21, ACCRA

LIST OF TOOLS AND EQUIPMENTS

1. A1 size drawing board
2. T-square for A1 drawing board
3. A2 and A3 drawing sheets (Cartridge)
4. Set squares (30º & 60º, 45º and adjustable
5. Drawing instruments (Note maths set)
6. Tracing paper
7. Drawing pens (Rapidograph) 0.2mm, 0.3mm, 0.4mm, 0.5mm (set)

8. Set of stencils (o.2mm, 0.3mm, 0.4mm and 0.5mm)
9. Architect's scale rule (metric)
10. Furniture and circle templates
11. Set of French curves
12. Surveyor's tape measure
13. Computers and accessories
14. LCD projector

CERTIFICATE ONE – TRADE TECHNOLOGY

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
1.0	SAFETY	1.1 Accident to person in the drawing room • First Aid to all injuries • Personal safety habits	1.2 Safe working techniques application.	Facilitator must guide trainees to know safety conditions pertaining at workshops and sites. Causes of accidents. Discuss with trainees the attitudinal requirement of them. E.g. Carefulness, paying of attentions at workshops.
2.0	INTRODUCTION TO TOOLS AND EQUIPMENT	2.1.1 Selection of tools and equipment 2.1.2 Describe correct and safe use of tools and equipment	2.2 Correct use and safe of tools and equipment	Demonstrate by displaying various tools and equipment to trainees for identification. (Use of real object)
3.0.	MAINTENANCE	3.1 Describe care and maintenance of tools and equipment	3.2 Safe use of tools and equipment	Discuss with trainees care and maintenance of tools and equipment.
4.0	DRAFTING	4.1. Purpose and functions of Drafting • Stages and preparation	4.2 Abbreviations and convectional symbols	Discuss the purpose and function of drafting with trainees. Guide trainees to use various symbols and conventions in drafting
5.0	PREPARATION OF DRAWINGS	5.1. Parties connected with the preparation of drawings such as architect, engineers etc.	5.2 Know the concept of drawings	Assist trainees to know personnel connected with preparation drawings and their duties.
6.0	DESIGNING	6.1 Factors affecting designing • Procedure in designing (formal and informal)	6.2 Elements of design such as colour, space, line, form etc.	Discuss with trainees the factors and procedures of designing and illustrate elements of designing.

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
7.0	BUILDING SITE PERSONALITIES	7.1 Building team • Design team • Contractor's team • Statutory team	7.2 Role and duties of the building personalities	Guide trainees to list members concern in building industry and their functions. E.g. client team, contractor's team, statutory personnel
8.0	SITE WORK	8.1 • Site preparation • Site clearance • Leveling • Security etc.	8.2 Access roads and services provision	Assist trainees know the Stages of sitework preparations. Emphasize on: • site clearance • site investigation • roads and access at sites etc.
9.0	HUTMENT	9.1 Temporary structures (storage facility, office facility etc.)	9.2 Location of temporary structures on site	Assist trainees to know some temporary structure needed at building sites. E.g. huts, shops, offices, site services like water etc.
10.0	SETTING OUT	10.1.1 Definition of setting out 10.1.2 Functional requirement of setting out 10.1.3 Methods of setting out 10.1.4 Methods of checking the accuracy of setting out 10.1.5 Uses of datum level	10.2 Various tools and equipment use in setting-out • Uses of profile boards and pegs • Uses of blocks for simple plans	Guide trainees to know the term setting out. It's • functional requirement • various methods of setting-out • tools and equipment used in setting-out operations. Etc.
11.0	EXCAVATION	11.1 Definition of excavation 11.2 Method of excavation 11.3 Tools and equipment used i.e. pick axe, shovels, mattocks, bulldozer, face shovels, etc.	11.2.1 Merits and demerits of the method used 11.2.2 Selecting of correct tools for excavation	Guide trainees to define excavation. • Purpose of excavation • Types of excavation • Equipment used • Safety requirement in excavation

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
12.0	LEVELLING AND PEGGING OF TRENCHES	12.1 Method used i.e. sight rail and boning rod • Peg to determine the thickness of concrete	12.2 Levelling and pegging	Discuss with students methods leveling and the Equipment used e.g. boning rod
13.0	TIMBERING TO TRENCHES	13.1 Definition of timbering • Materials used • Methods of supporting	13.2 Merits and demerits of various materials used in timbering	Discuss and illustrate with trainees the reason for supporting sides of trenches with sketches. Discuss with trainees types of soil, etc.
14.0	SAFETY	14.1 Safety precautions to be taken during excavation in personal safety and safety to public	14.2 Forms of safety measure	Discuss how to ensure safety during digging of trenches.
15.0	FOUNDATION	15.1.1 Definition of foundation 15.1.2 Purpose of foundation 15.1.3 Categories of foundation 15.1.4 Types of foundation and uses 15.1.5 Factors affecting the choice of foundation	15.2 Terminology	Guide and assist trainees to define the term foundation. • Types of foundation with Sketches • Purpose of foundation • Factors to be considered in choosing or selecting foundation type for a project.
16.0	CONCRETING	16.1.1 Definition of concreting 16.1.2 Types of concreting 16.1.3 Uses of concrete 16.1.4 Materials and their functions	16.2 Sources of concrete materials	Guide trainees to define the term concrete. • List materials used in concrete production and their purpose

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
17.	PRODUCTION OF CONCRETE	17.1.1 Batching of materials 17.1.2 Mixing of materials 17.1.3 Transporting of concrete 17.1.4 Placing of concrete 17.1.5 Compaction/consolidation of concrete	17.2 Merits and demerits of method of batching and mixing	Discuss the methods of batching. (By weight and by volume) with trainees. • Water/cement ratio
18.	GRADING OF AGGREGATES	18.1 Definition of grading • Effects of grading • Segregation • Effect of segregation • Factors influencing bulking	18.2 Merits of grading of aggregate	Guide trainees to define gradin aggregates. Discuss with trainees the; • Effect of grading • Segregation and it's effect • Factors influencing bulking
19.	PROPORTION OF MIXES	19.1.1 Importance of water/ cement ratio 19.1.2 Importance of cement/aggregate ratio 19.1.3 Various test used in concrete works	19.2 Effects of water/cement ratio and cement/aggregate ratio	Discuss the various proportion Used in mixing concrete materials. (1:2:4 for reinforcem concrete, 1:3:6 for mass concrete) water/cement ratio in a mixture of concrete. • Discuss various test to be conducted in concrete production e.g. Silt, Compacting factor etc.
20.	WALLING	20.1.1 Definition of bonding 20.1.2 Purpose of bonding 20.1.3 Rules of bonding 20.1.4 Types of bonding such as i) Header bond ii) Stretcher bond iii) English bond iv) Flemish bond v) English-Garden wall bond vi) Flemish-Garden wall bond	20.2 Terminologies i) Bed joint ii) Racking back iii) Toothing iv) Perpends stopped ends	Guide trainees to explain the term bonding. Guide trainees to explain types of bonding and principles. Use sketches to illustrate different types of bonding. E.g. English bond, Flemish bond etc.

CERTIFICATE ONE – TRADE TECHNOLOGY

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
21.	CLASSIFICATION OF WALLS	21.1.1 Load-bearing walls Non-load bearing walls 21.1.2 Functions of load bearing and non-load bearing walls	21.2 Identification of load bearing and non-load bearing walls	• Assist trainees to know the term wall in building construction. • Guide trainees to identify types of wall e.g. (Load bearing and non-load bearing walls) • Discuss method of constructing walls. • Discuss functions of walls with trainees
22.	OPENINGS	22.1.1 Bridging over opening such as i) Lintels ii) Arches etc iii) Functions of lintels and arches	22.2 Material used for bridging	• Demonstrate methods of bridging opening in wall to • Receive doors/windows • Discuss how openings are • Bridged using arches. • Discuss functions of lintels How • Doors/windows are hang and fixed, the techniques involve.

CERTIFICATE ONE – SCIENCE AND CALCULATION

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
1.0	OPERATIONS	1.1Addition, subtraction, multiplication and division	1.2 Safe working techniques	• Guide trainees to come out with how operation are used. +, -, x, ÷ • Discuss with trainees how to apply BODMAS with the operation system.
2.0	FRACTIONS	2.1 Proper fractions, improper fractions, and vulgar fractions	2.2 Comparing fractions using < =, and >	• Brainstorm with trainees to come out with the meaning of fraction. • Discuss types of fraction e.g. common, decimal. • Guide trainees to compare fractions using <, >, =
3.0.	DECIMALS	3.1 Addition and subtraction to decimals, multiplication and division to decimals change vulgar fractions to decimals	3.2 Placement of decimal points	• Discuss with trainees the convection of common fraction to decimal and vice versa. • Guide trainees to compare and order decimal fractions e.g. (ascending and descending)
4.0	MEASUREMENT	4.1 Using S.I Units multiplication and division of decimals	4.2 Conversion of scales (F.F)	Discuss the uses of various S.I. units in solving problems. (Linear, mass and capacity or volume) (meter, millimeters, grammes, liters)
5.0	PERCENTAGES AND RATIOS	5.1 Calculation on percentages and ratio calculation on average proportion, and square roots	5.1 Convert decimals into percentages	Revise with trainees fraction and how it can be converted to percentages and ratios. Discuss the uses of percentage and ratio as a fractions.

CERTIFICATE ONE – SCIENCE AND CALCULATION

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
6.0	ELEMENTARY GEOMETRY	6.1 Calculation of elementary Geometry		Discuss with trainees to identify various geometrical shapes. E.g. squares, rectangles, rhombus, kite etc. Assist trainees to deduce formulars for solving geometrical shapes.
7.0	TRIGNOMETRY	7.1 Calculation of trigometry	7.2 Angles of elevation	• Guide trainees to come out with the ratios of trigonometry (sine, cosine, tangent) • Discuss right-angled triangle with trainees. Note: Adjacent, opposite and hypotenuse. • Discuss opposite and adjacent position in respect to angles. • Application of trigonometry ratios. • Angles of elevation and depression.

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
8.0	PYTHOGORAS' THEOREM	8.1 Sine, cosine and tangent (Soh,cah,toa)	8.2.1 Identification of sides of right-angle triangle	Discuss the principles of Pythagoras theorem in relation to right-angled triangle. Assist trainees to deduce the formular in solving problems of Pythagoras theorem. (Square on hypotenuse = sum of the squares on the other two sides of right-angled triangle $Ac^2 = ab^2 + bc^2$ or $x^2 = y^2 + Z^2$
9.0	DENSITY	9.1 Density, mass, volume, relative density and their experiment	9.2 Formulae, bulk density and solid density	Assist by defining density to trainees; Importance of density Discuss measurements of density in relation to regular and irregular objects. Densities in liquids Guide trainees to determine density by use of formular $D = \frac{M}{V}$ where M = mass, V = volume. Assist in define relative density Discuss relative density measurement using masses and densities etc.
10.0	PRESSURE	10.1 Pressure in liquids and calculation (Hydrostatic pressure)	10.2 Concrete use of formulae	Guide trainees to define pressure in liquid. Discuss how pressure in liquids increases with depth and how pressure in liquid at any point acts in all directions etc.

CERTIFICATE ONE – SCIENCE AND CALCULATION

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
11.0	FORCES	11.1.1 Definitions of force, types 11.1.2 Types of force and their calculations	11.2.1 Measurement of Forces 11.2.2 Knowing S.I. unit of forces	Assist trainees to define force and state its types. Frictional, gravitational State S.I. units of forces (N) Assist trainees in calculating force using the formular: Force = Mass x Acceleration Where mass (kg), Acceleration (m/s^2) Force = Newton (N)
12.0	POROSITY OF BUILDING MATERIALS	12.1 Definition of porosity, void, absorption, permeability and their calculations	12.2 The rate of absorption of different building materials	Assist trainees to define: Porosity, void, absorption and permeability. Discuss how to use the formulae in calculating the following listed above: That is: Porosity = $\frac{\text{Solid density – Bulk density}}{\text{Solid density}}$ Water absorption rate = $\frac{\text{Saturated wt. – Oven dry wt.}}{\text{Oven dry wt.}}$ etc.
13.0	13.1 BULKING	13.1 Definition of bulking, bulking of sand and silt, silt test	13.2.1 Rate of bulking of different building materials 13.2.2 Listing of apparatus for performing silt test.	• Brainstorm to define bulking of sand/silt. • Assist trainees to carry out an experiment/test in order to determine bulking of (sand), and the cleanliness of sand on site by the field settling test/silt test).

CERTIFICATE ONE – SCIENCE AND CALCULATION

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
14.0	CAPILLARITY IN BUILDING	14.1 Definition of capillarity, sources of moisture into building, effect of moisture in building	14.2 Preparation of moisture into building.	Brainstorm to define capillarity Discuss the sources of moisture and its effect on buildings
15.0	SURFACE TENSION	15.1.1 Definition of surface tension 15.2.1 Cohesion and adhesion 15.2.2 Effects of cohesion and adhesion	15.2 Relative viscosity of liquids (water, alcohol, mercury etc.)	Assist trainees to define the terms: surface tension cohesion adhesion discuss the effects of cohesion and adhesion
16.0	DAMPNESS IN BUILDING	16.1.1 Causes of dampness in building Effect of dampness in building Prevention of dampness in building	16.2.1 Identification of damp proof materials 16.2.2 Correct use of damp proof materials	Brainstorm to identify the causes of dampness in building By using d.p.c., d.p.m. etc.
17.0	AREAS, PERIMETERS AND VOLUMES	17.1 Areas, perimeters and volumes of regular and irregular objects	17.2.1 Knowing formulae of calculating	Discuss parts of the circle with trainees. Guide trainees to deduce the formular for the length of arc, perimeters of rectangles, squares, and other plane figures with various sides. Guide trainees to find the areas and volumes and of circle and quadrilaterals.
18.0	QUALITY OF MATERIALS	18.1 Calculation of materials such as brick, block, cement, tiles etc.	18.2 Indicating allowances and waste	Assist trainees to calculate the quality of building materials. E.g. number of blocks/bricks, tiles, cement etc.

CERTIFICATE ONE – SCIENCE AND CALCULATION

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
19.0	MOMENTS OF FORCE	19.1 Definition of moment, principles of moment • Calculation of moment using i. Moment method	19.2 Action and reactions forces, clockwise moment and anti-clockwise moment of a force.	Assist trainees to define moment of force. Discuss the principles of moment i.e. C.W.M. = A W M Clockwise moments = Anti-clockwise moments 200N x 3m = 600NM = 300 x 2 = 600NM Sum of upward forces = forces of downward forces
20.0	POWER	20.1 Definition of power o Unit o Calculations involved power	20.2 Knowing formulae in calculating	Brainstorm to define and its S.I. unit. i.e. power = Workdone (W) watt / Time taken Assist trainees to calculate some given examples of power using the formula; power = Workdone / Time taken
21.0	WORK DONE	21.1 Definition of work done o Calculations o Units	21.2 Formulae used	Help trainees in defining workdone • Guide trainees to deduce the formula for workdone and its application to solve problems. • Discuss the S.I. unit of workdone. Joule (J).

CERTIFICATE ONE – SCIENCE AND CALCULATION

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
22.0	ENERGY	22.1.1 Definition of energy 22.1.2 Forms of energy 22.1.3 Sources of energy 22.1.4 Calculations of energy	22.2.1 The S.I. Unit 22.2.2 Listing forms of energy and sources 22.2.3 Knowing formulae uses	Brainstorm to define energy. • Discuss the various the various forms of energy. E.g. kinetic energy, potential etc. • Discuss sources of energy • Heat • Light etc. • Assist trainees to calculate energy on some given questions. • Kinetic energy (K.E) = $1/mv^2$ • Potential energy

CERTIFICATE ONE - BUILDING DRAWING (PRACTICALS)

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
1.0	INTRODUCTION TO TOOLS AND EQUIPMENT AND MATERIALS	1.1Identification of various tools used	1.2 Used of the various tools Identified correctly.	Facilitator must show various tools and equipment to trainees to note as well as discuss their uses.
2.0	SAFETY	2.1. Safety to persons in the drawing room 2.1.2 Safe use of tools and equipment	2.2 First Aid to all injuries, safe working techniques, personal safety	Discuss safety precautions or Measures to trainees to minimize accidents in drawing studios.
3.0.	MAINTENANCE	3.1 Correct handling, care and uses of tools, equipment and materials	3.2 Merit and demerit of handling tools, equipment and materials	Discuss how to maintain drawing Tools and equipment and it's importance
4.0	SCALES	4.1 Introduction to metrification, imperial and their equivalents	4.2 Reading of scales such as 1:100, 1:50, 1:20 etc.	Display and demonstrate the use of scales both metric and imperial system and their equivalents.
5.0	APPLICATION OF TOOLS AND EQUIPMENT AND MATERIALS	5.1. Mounting of drawing sheets and construction of boarder lines and title blocks.	5.2 Lettering, line work, types of lines and their uses	Demonstrate to trainees how various tools and equipment are used
6.0	DIVISION OF LINES	6.1 Bisection, dividing lines into a number of equal parts and ratios	6.2 Correct use of a pair of compass and a dividers	Demonstrate how lines could be divided into a number of equal parts using a pair of compass and dividers.
7.0	DRAWING OF VARIOUS LINES AND ANGLES	7.1 Drawing of perpendicular lines using different data, parallel lines, angles and triangles.	7.2 Construction of lines, angles and triangles	Illustrate to trainees how parallel and, perpendicular lines, angles and triangles can be constructed.
8.0	QUADRILATERAL AND POLYGONS	8.1.Identification of various quadrilateral and polygons	8.2 Construction of quadrilateral and polygons	Discuss types of angles and their Differences.
9.0	CIRCLES AND THEIR PROPERTIES	9.1.Identification of parts of circles	9.2 Construction of circle	Illustrate and guide trainees to know how to construct quadrilaterals and polygons using various methods.

CERTIFICATE ONE - BUILDING DRAWING (PRACTICALS)

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
10.0	INSCRIBE, ESCRIBE AND CIRCUMSCRIBE	10.1 Drawing of inscribe, escribe and circumscribe circles	10.2 Uses of compass correctly	Demonstrate to show how objects c be inscribed, escribed and circumscribed with circles
11.0	ARCS	11.1 Drawing of arcs with straight lines and points	11.2 Principles of arcs construction	Illustrate the principles of constructing arcs using straight lines and points.
12.0	FREEHAND SKETCHES	12.1 Sketching of all tools and equipment used in draughtsmanship	12.2.1 Correct use of pencil in sketching 12.2.2 Principles and techniques involve	Demonstrate and illustrate to Trainees how the various tools and equipment are drawn in views and projections (orthographic and pictorial
13.0	PLANS, SECTIONS AND ELEVATIONS OF A BUILDING	13.1 Definition of plans, sections and elevation and their respective drawings	13.2.1 Identification of plans, sections and elevation	Facilitator must assist trainees in defining plans sections and elevations.
14.0	SECTIONS OF DOORS AND WINDOWS	14.1 Drawing of sections of doors and windows	14.2 Labelling of parts of doors and windows	Use samples to illustrate to trainees how to draw a section through doors and label it's parts.
15.0	DRAWING OF PLANS	15.1 Drawing of plan of one bed room house with porch	15.2 Indicating wall thickness, doors, windows and correct dimensions using scales	Demonstrate and discuss to trainees how a plan of buildings are formed and drawn. Illustrate doors and windows and dimensioning to trainees to note and practice. Illustrate grid lines and purpose to trainees
16.0	DRAWING OF PLANS	16.1 Drawing of plans (increasing the number of bedrooms	16.2 Drawing of grid lines and numbering	Discuss with trainees how additional rooms can be added to an existing plan and the purpose

CERTIFICATE ONE - BUILDING DRAWING (PRACTICALS)

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
17.0	DRAWING OF SECTIONS	Drawing of horizontal and vertical sections	17.2 Drawing of longitudinal and cross-sections	Discuss and demonstrate how A section (cross and horizontal) is drawn and project from a ground floor plan of a building. Use sample drawings in illustrating
18.0	ELEVATIONS	18.1 Drawing of elevations in two dimensional	18.2 Projection of elevations from plans and sections	Assist trainees through Demonstration how elevations are projected from plan and section of a building plan.
19.0	ORTHOGRAPHIC PROJECTION	Arranging of drawings in orthographic projection of simple buildings (1st angle)	19.2 Drawing in 1st angle projection	Illustrate to trainees how to draw Objects and buildings in orthographic projection. Emphasize on first angle projection
20.0	ORTHOGRAPHIC PROJECTION	20.1 Arranging of drawing in orthographic projection for simple buildings (3rd angle)	20.2.1 Drawing in 3rd angle projection 20.2.2 Differentiate between 1st and 3rd angle projections	Demonstrate how orthographic projection are drawn in 3rd angle
21.0	ISOMETRIC AND AXONOMETRIC	21.1 Drawing of isometric and axonometric	21.2 Using 30° and 45° set square to draw isometric and axonometric respectively	Demonstrate to trainees how Isometric and axonometric using their required angles.
22.0	FOUNDATION PLAN	22.1Drawing of foundation plans	22.2 Indicating column and the various types of walls	Demonstrate to trainees how foundation plan is drawn. Use sample drawing to illustrate the column, and sleeper walls
23.0	SECTION OF FOUNDATION PLANS	231 Drawing of cross-section of previous foundation plans	23.2 Indicating of floor levels and depth of foundation	Use sample drawing to illustrate h foundation section is drawn showi the following; i. hardcore filling ii. natural earth fitting Floor level and specification

CERTIFICATE ONE - BUILDING DRAWING (PRACTICALS)

NO	TASK	CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
24.0	SHAPED PRINCIPLES	24.1 Design of an L-shaped building with elevation and sections	24.2 Projection of required elevations and sections.	Guide trainees to use shapes of alphabet to create a design e.g. L-shape
25.0	SHAPES OF BUILDINGS	25.1 Design of other shapes	25.2.1 Uses of other shapes of alphabet to design e.g. 'U'	Guide trainees to use other shape of letters to create design. E.g. U-shape, H-shape etc.
26.0	ROOFING	26.1 Drawing of types of roof such as monopitch, double pitch etc.	26.2.1 Projection of plans of building.	Demonstrate to the trainees the various type of roofs and let them practice. E.g. gable, mono-pitch, etc.
27.0	ROOF PLANS	27.1 Drawing of roof plans of various types of roof	27.2 Indicating roof members and their specification	Use sample drawings to illustrate h roof plans are drawn. Emphasize c the roof members.
28.0	AUTOCAD (1)	28.1.1 Drawing of plans using AUTOCAD concept. 28.1.2 Outline principles of AUTOCAD application	28.2.1 Identification of tools and their uses (various symbols) 28.2.2 Use principles of AUTOCAD correctly	Guide trainees to identify the vario tools use drawing. Discuss the principles of AutoCAD various setting modes, templates a how they are use.

RECOMMENDED BOOKS

1. Aki-Ola Series
   Integrated Science for Senior Secondary School
   (2005 Edition) (Science)
   By Charles Amoako, Peter Asiedu

2. Aki-Ola Series
   Core Maths for Senior Secondary School (1993)
   (Third Edition 2004)
   Aki-Ola Publications – Accra, Ghana.
   By Peter Asiedu

3. R. Barry
1978, The Construction of Building (2nd Edition)
Crosby Lockwood & Son Ltd.
3 Upper James Street, London, WIR 4BP
Granada Publishing Ltd (Building Construction)

4. Vincent B. Amevordzie
1994 Building Construction for Senior Secondary School
(2nd Edition)
Longman Group U.K. Limited (Building Construction)

5. R. Chudley & R. Greeno. (1988)
Building Construction Handbok (Fourth Edition)
MPG Book Ltd. Bodmin, Cornwall
Great Britain

6. W.B Mckay
1981 Building Construction (5th Edition)
Longman house, Burnt Mill, Harlow
Essex, U.K
Longman Group Ltd. (Building Construction)

7. Donald E. Helper, Paul I. Wallah
1965, Architecture: Drafting and Design (Fifth Edition
McGraw-Hill, Inc. (Drafting)
USA

8. E.C. Adams
1974. Science in Building (3rd Edition)
Hutchison Educational Ltd.
3 Fitzroy Square, London WI (Science)
The Ancho Press Ltd.