NATIONAL BOARD FOR TECHNICAL EDUCATION

CURRICULUM AND COURSE SPECIFICATIONS

FOR

NATIONAL DIPLOM (ND)

IN

ARCHITECTURAL TECHNOLOGY

OCTOBER 2020

Produced by the National Board for Technical Education (NBTE)

In conjunction with

ARCHITECTS REGISTRATION COUNCIL OF NIGERIA (ARCON)

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GENERAL INFORMATION

1.0 CERTIFICATION AND TITLE OF PROGRAMME

The certificate to be awarded and programme title shall read:

NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY and

A transcript showing all the courses taken and grades shall be issued together with the certificates.

2.0 GOAL AND OBJECTIVES

2.1 GOAL

2.1.1 The **National Diploma** programme in Architectural Technology is aimed at producing technicians for the architectural profession within the private and public sectors..

2.2 OBJECTIVES

2.2.1 At the end of the **National Diploma** programme in Architectural Technology, the diplomats will be able to:

i) Read, interpret and trace drawing;

ii) Produce Letter and stencil drawing sheets;

iii) Produce Scale, dimension, blow-up and reduce drawings;

iv) Produce basic presentation and perspective drawings;

v) Make a good freehand sketch;

vi) Produce basic presentation and perspective drawings;

vii) Build simple models;

viii) Print, fold and collate drawings for submission;

ix) Set out simple buildings.

3.0 ENTRY REQUIREMENTS

3.1 The general entry requirements into the **National Diploma** in Architectural Technology programme are:

3.1.1 Post basic Education Certificate (Post JSS) with at least 5 credit level passes at not more than two sittings in the following examinations or equivalent:

i) **WASSCE/SSCE/GCE**

English Language, Mathematics, Physics and any two subjects from the following:
Biology/Agricultural Science, Chemistry, Geography, Further Mathematics, Economics/Commerce, Technical Drawing/Graphic Design, Painting & Decoration/Fine Art, Building Construction, Woodwork, Basic Electronics, Computer Studies.
A pass in Technical Drawing/Fine Art will be an advantage.

ii) **NTC/NBC**

English Language, Mathematics, Physics and any two subjects from the following:
Biology/Agricultural Science, Chemistry, Financial Accounting, Draughtsman ship/Graphic Design, Painting & Decoration, Introduction to Building Construction, Block laying/Bricklaying & Concreting, Machine Woodworking, Electrical Installation & Maintenance Works, Computer Craft Studies

iii) **NVC**

English Language, Mathematics, Physics and any two trade subjects from the following:
Block Laying & Concreting, Carpentry & Joinery, Computer Studies, Electrical Installation & Repair Works, Agriculture

3.1.2 Unemployed or under-employed graduates with basic O'level qualification looking for requisite employable skills in architecture.

3.1.3 Those out of school for a long time with basic O'level qualification, in line with Government desire for open access to re-skilling and up-skilling of the nation's work force as part of lifelong learning (LLL)

4.0 CURRICULUM

4.1 The curriculum of the **National Diploma** Architectural Technology programme consists of four main components:

i) General Studies/Education;

ii) Foundation Courses;

iii) Professional Courses;

iv) Supervised Industrial Work Experience Scheme (SIWES).

4.2 The General Education component should include courses in - English Language and Communication, Economics, Citizenship Education and Entrepreneurship studies. Others may include History, Political Science, Sociology, Geography, Philosophy etc. The General Education component should be between 10 - 15% of total contact hours for the programme.

4.3 Foundation Courses include in Mathematics, Pure Science, Economics, Technical Drawing, Descriptive Geometry, Statistics etc. The number of hours should be between 10 - 15% of the total contact hours.

4.4 Professional Courses are courses which give the students theory and practical skills needed to practice the profession at the technician/technologist level. These may account for 70-80% of the total contact hours.

4.5 Supervised Industrial Work Experience Scheme (SIWES) shall be taken during the long vacation following the end of the second semester of the first year. See details of SIWES at paragraph 9.0

5.0 CURRICULUM STRUCTURE

5.1 The structure of the **National Diploma (ND)** programme consists of four semesters of classroom, laboratory and workshop/field activities in the college as well as a semester (3 – 4 months) of Supervised Industrial Work Experience Scheme (SIWES). Each semester shall be 17 weeks of duration made up as follows:

- ✓ 15 contact weeks of registration, teaching (lecture, recitation, practical exercises/field work, and quiz)

- ✓ 2 weeks of examination

SIWES shall take place at the end of the second semester of the first year at ND.

6.0 PROJECT

Project shall be submitted at the end of second semester of final year at each of National Diploma and Higher National Diploma.

7.0 ACCREDITATION

Each programme offered at the ND level shall be accredited by the NBTE before the diplomates can be awarded the diploma certificates. Details about the process of accrediting a programme for the award of the ND are available from the Executive Secretary, National Board for Technical Education, at Plot B, Bida Road, P.M.B. 2239; Kaduna, Nigeria.

7.1 CONDITIONS FOR THE AWARD OF THE NATIONAL DIPLOMA (ND) IN ARCHITECTURAL TECHNOLOGY

Institutions offering accredited programmes will award the National Diploma in Architectural Technology to a candidate who successfully completes the programme after passing prescribed course-work, examination, diploma project and supervised Student Industrial Work Experience Scheme (SIWES). Such a candidate should have completed 90-100 credit unit. National Diploma certificate shall be awarded based on the following:

i) Grading of courses

The standardized unified grading system shall be as follows:

Marks Range	Letter Grade	Weighting
75% and above	A	4.0
70% - 74%	AB	3.50
65% - 69%	B	3.25
60% - 64%	BC	3.00
55% - 59%	C	2.75
50% - 54%	CD	2.50
45% - 49%	D	2.25
40% - 44%	E	2.00
Below 40%	F	0.0

ii) Classification of Diploma

Diploma Certificates shall be awarded based on the following Classifications:

CGPA	Class of Diploma
3.50 – 4.00	Distinction
3.00 – 3.49	Upper Credit
2.50 – 2.99	Lower Credit
2.00 – 2.49	Pass

8.0 GUIDANCE NOTES FOR TEACHERS OF THE PROGRAMME

8.1 The new curriculum is drawn in unit courses. This is in keeping with the provisions of the National Policy on Education which stresses the need to introduce the semester credit units which will enable a student, who so wish, to transfer the units already completed in an institution of similar standard from which he is transferring.

8.2 In designing the units, the principle of the modular system by product has been adopted, thus making each of the professional modules, when completed provides the student with technician operative skills, which can be used for employment purposes.

8.3 As the success of the credit unit system depends on the articulation of programmes between the institution and industry, the Curriculum content has been written in behavioural objectives, so that it is clear to all the expected performance of the student who successfully completed some of the courses or the diplomates of the programme. There is a slight departure in the presentation of the performance based curriculum which requires the conditions under which the performance is expected to be carried out and the criteria for the acceptable levels of performance. It is a deliberate attempt to further involve the staff of the department teaching the programme to write their own curriculum stating the conditions existing in their institution under which the performance can take place and follow that with the criteria for determining an acceptable level of performance. The Academic Board of the institution may vet departmental submission on the final curriculum. Our aim is to continue to see to it that a solid internal Evaluation system exist in each institution for ensuring minimum standard and quality of education in the programmes offered throughout the polytechnic system.

8.4 The teaching of the theory and practical work should, as much as possible, be integrated. Practical exercises, especially those in professional courses and laboratory work should not be taught in isolation from the theory. For each course, there should be a balance of theory to practice in the ratio of 50:50 or 60:40 or the reverse.

9.0 GUIDELINE OF SIWES PROGRAMME

For the smooth operation of the SIWES, the following guidelines shall apply:

9.1 Responsibility for placement of students

a) Institutions offering the ND programme shall arrange to place the students in industry by April 30 of each year, six copies of the list showing where each student has been placed shall be submitted to the Executive Secretary, NBTE which shall in turn, authenticate the list and forward it to the industrial training fund, Jos.

b) The placement Officer should discuss and agree with industry on the following:

   i) A task inventory of what the students should be expected to experience during the period of attachment. It may be wise to adopt the one already approved for each field.

   ii) The industry-based supervisor of the students during the period, likewise the institution based supervisor

It should be noted that the final grading of the student during the period of the attachment should be weighted more on the evaluation by his industry-based supervisor

9.2 Evaluation of students during the SIWES

In the evaluation of the student, cognizance should be taken of the following items:

a) Punctuality
b) Attendance
c) General Attitude to Work
d) Respect for Authority
e) Interest in the Field/Technical area
f) Technical competence as a potential technician in his field

9.3 Grading of SIWES

To ensure uniformity of grading scales, the institution should ensure that the uniform grading of student's work, which has been agreed to by polytechnics, is adopted.

9.4 The Institution Based Supervisor

The Institution-based supervisor should initiate the logbook during each visit. This will enable him to check and determine to what extent the objective of the scheme are being met and to assist students having any problems regarding the specific assignments given to them by their industry-based supervisor.

9.5 Frequency of Visit

Institution should ensure that students placed on attachment are visited within one month of their placement. Other visits shall be arranged so that:

1) There is another visit six weeks after the first;
2) A final visit in the last month of the attachment.

9.6 Stipends for Students in SIWES

The rate of stipend payable shall be determined from time to time by the Federal Government after due consultation with the Federal Ministry of Education, the Industrial Training Fund and the NBTE.

9.7 SIWES as a Component of the Curriculum

The completion of SIWES is important in the final determination of whether the student is successful in the programme or not. Failure in the SIWES is an indication that the student has not shown sufficient interest in the field or has no potential to become a skilled technician in his field. The SIWES should be graded on a fail or pass basis. Where a student has satisfied all other requirements but failed SIWES, he may only be allowed to repeat another four months SIWES at his own expense.

PROGRAMME: NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY

ND I: SEMESTER ONE

COURSE CODE	COURSE TITLE	L	P	CU	CH	PRE-REQUISITE
ARC 111	Basic Design	1	2	3	3	- -
ARC 112	Freehand Sketching	0	2	2	2	- -
ARC 113	Building Construction I	1	2	3	3	- -
ARC 114	Nigerian Traditional Architecture	2	0	2	2	- -
ARC 115	Mathematics for Architecture Students	2	0	2	2	- -
ARC 116	Building Science	2	0	2	2	- -
ARC 117	Surveying for Architecture Students	1	2	3	3	- -
BLD 105	Workshop Practice I	0	4	4	4	- -
ICT 101	Computer Application I	0	4	4	4	- -
GNS 101	Use of English I	2	0	2	2	- -
GNS 111	Citizenship Education	2	0	2	2	- -
TOTAL		**13**	**16**	**29**	**29**	- -

ND I: SEMESTER TWO

COURSE CODE	COURSE TITLE	L	P	CU	CH	PRE-REQUISITE
ARC 121	Architectural Design I	1	3	4	4	- -
ARC 122	Technical Drawing	0	2	2	2	- -
ARC 123	Building Construction II	1	2	3	3	- -
ARC 124	Architectural Graphics I	0	3	3	3	- -
ARC 125	Properties of Materials	2	0	2	2	- -
ARC 126	Introduction to Computer Aided Design	0	3	3	3	- -
ARC 127	History of Architecture	2	0	2	2	- -
BLD 106	Workshop Practice II	0	4	4	4	- -
GNS 102	Communication Skills I	2	0	2	2	- -
EED 126	Introduction to Entrepreneurship	2	0	2	2	- -
TOTAL		**10**	**17**	**27**	**27**	- -

KEY:

L: Lecture
P: Practical
CU: Credit Unit
CH: Contact Hour (Per Week)

PROGRAMME: NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY

ND II: SEMESTER ONE

COURSE CODE	COURSE TITLE	L	P	CU	CH	PRE-REQUISITE
ARC 211	Architectural Design II	1	3	4	4	ARC 111
ARC 212	Photography and Model-making	0	2	2	2	- -
ARC 213	Building Construction III	1	2	3	3	ARC 113
ARC 214	Architectural Graphics II	0	3	3	3	- -
ARC 215	Strength of Materials	1	2	3	3	ARC 116
ARC 216	Computer Aided Design: 2-Dimensional Drawing	0	3	3	3	- -
ARC 217	Building Services	1	2	3	3	- -
ARC 218	Technical Report Writing	1	0	1	1	- -
BLD 205	Workshop Practice III	0	3	3	3	BLD 105
EED 216	Practice of Entrepreneurship	1	1	2	2	- -
SWS 221	SIWES	0	3	3	0	- -
TOTAL		**6**	**24**	**30**	**27**	- -

ND II: SEMESTER TWO

COURSE CODE	COURSE TITLE	L	P	CU	CH	PRE-REQUISITE
ARC 221	Architectural Design Project & Report	1	5	6	6	ARC 121
ARC 222	Site Management	1	1	2	2	- -
ARC 223	Building Construction IV	1	2	3	3	ARC 123
ARC 224	Architectural Graphics III	0	3	3	3	ARC 124
ARC 225	Measurement and Specifications	2	0	2	2	- -
ARC 226	Computer Aided Design: 3-Dimensional Drawing	0	3	3	3	ARC 126
ARC 227	Maintenance Technology	1	1	2	2	- -
ARC 228	Basics of Climatology	2	0	2	2	- -
BLD 206	Workshop Practice IV	0	3	3	3	BLD 106
	TOTAL	**8**	**18**	**26**	**26**	- -

KEY:

L: Lecture
P: Practical
CU: Credit Unit
CH: Contact Hour (Per Week)

ARCHITECTURAL TECHNOLOGY

ND I

FIRST SEMESTER COURSES

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE NAME: **BASIC DESIGN**

COURSE CODE: **ARC 111**

DURATION: **1 –2 – 3 – 3**

CREDIT UNITS: **3 UNITS**

GOAL: The course is designed to develop student's interest and creative ability in architecture

GENERAL OBJECTIVES: On completion of this course the student should be able to:

1) Know the basic elements of design;
2) Understand the general space requirements for different functions in a residential building;
3) Understand the basic design process, reproductive equipment and materials
4) Design and model simple components of a residential building such as kitchens, bedrooms etc
5) Produce models and axonometric drawings of units in 4 above.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 2 – 3 – 3**
COURSE TITLE	**BASIC DESIGN**				**COURSE CODE**	**ARC 111**
GOAL	**THE COURSE IS INTENDED TO DEVELOP THE INTEREST AND CREATIVE ABILITY OF THE STUDENT IN ARCHITECTURE**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Know the basic elements of design					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 3	1.1 Identify the basic principles of the design process 1.2 List the elements in architectural design 1.3 Describe the development of current design concepts and theories	• Explain basic principles of design process • Explain different elements in architectural design • Describe the development of Design concepts and theories	Chalkboard PowerPoint presentation and AV projection equipment. Exemplars	1.1 Demonstrate basic design process 1.2 Illustrate the elements of design 1.3 Illustrate the current design concepts and theories	• Guide student how to perform basic design • Guide students how to identify various elements of design • Show students how to illustrate the current design concepts and theories	• Enumerate basic principles of design process • What are the elements in architectural design • Explain the development of current design concept and theories
GENERAL OBJECTIVE 2	Understand the general space requirements for different functions in a residential building					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
4 – 6	2.1 Define anthropometric data in relation to a residential building 2.2 Explain space planning 2.3 Explain the relationship of one space to another	• Explain anthropometric data in relation to a residential building • Describe space planning • Explain the relationship between a space and another	Relevant Textbooks, Measuring tapes, Drawing papers, clutch pencils, erasers, T-Square, set square, French curve etc Chalkboard, PowerPoint presentation and AV projection equipment.	2.1. Illustrate to students how to derive anthropometric data for space requirement in a residential building 2.2. Illustrate Space Planning exercise 2.3. Sketch an area to a suitable scale to explain the relationship of one space to another	• Guide students how to derive anthropometric data using the data work out spaces needed for movement within a building. • Organize a visit to residential buildings for students to appreciate space planning process and the relationship of spaces to one another .	• Analyze anthropometric data in a residential building • Reproduce an area of a residential building to a suitable scale
GENERAL OBJECTIVE 3	Understand the basic design process, reproductive equipment and materials					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
7 – 8	3.1. Explain architectural design and architectural design processes 3.2. List steps taken in architectural design process 3.3. Explain the basic concepts in architectural design	• Explain architectural design and architectural design processes • Explain steps taken in architectural design process	Board PowerPoint Presentation and AV projection equipment. Exemplars	3.1. Create simple shapes such as boxes, cylinders, prisms, etc. 3.2. Visualize these objects in terms of space, area and volume 3.3. Produce simple abstract	• Guide student to create simple shapes • Guide student to produce abstract designs • Explain how 2-D drawings; plans,	• Explain architectural design • What is the different between architectural design and architectural design process

		• Explain the basic concept of space; line, area, volume and their relation to architectural design process • Explain how to generate simple architectural drawings such as plans, elevation, section and other 2-D drawings as part of the design process.		designs	sections elevations, etc. of these simple objects are generated • Illustrate the concept of abstract design	• Explain briefly basic concepts in architectural design
GENERAL OBJECTIVE 4		Design and model simple components of a residential building				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
7 – 9			Relevant Text books, Chalkboard PowerPoint presentation and AV projection equipment.	4.1. Design simple components of a residential building 4.2. Model simple components of a residential building	• Guide the student to design units of simple residential buildings • Guide the student to model units of simple residential buildings	• Design five components of a residential building • Model two components of a residential building
GENERAL OBJECTIVE 5		Produce models and axonometric drawings of units in 4 above				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
10 – 15			Relevant Text books drawing studio, modeling tools, etc.	5.1. Produce models and axonometric views 5.2. Demonstrate creative problem solving. 5.3. Apply the use of appropriate color in models and axonometric views	• Guide student to produce models and axonometric views in the Modelling studio • Illustrate 2D and 3D conceptual exploration using sketches and abstract models • Discuss materials, finishes, colour etc.	• Produce models and corresponding axonometric views

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 111)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE NAME: **FREEHAND SKETCHING**

COURSE CODE: **ARC 112**

DURATION: **0 – 2 – 2 – 2**

CREDIT UNITS: **2 UNITS**

GOAL: This course is designed to acquaint students with basic principles of drawing using a range of media to record and communicate visual information

GENERAL OBJECTIVES: On completion of this course the student should:

1) Know how to develop analytical drawing skills
2) Undertake Pencil Sketching
3) Undertake the Principle of Line Weight and shading in sketching
4) Produce sketches using Pen and ink
5) Draw perspectives
6) Use a range of drawing media in exploring drawing as a means of communicating visual information.
7) Produce simple still life and abstract sketches in colours

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**			**CONTACT HOURS**		**0 – 2 – 2 – 2**
COURSE TITLE	**FREEHAND SKETCHING**			**COURSE CODE**		**ARC 112**
GOAL	**THIS COURSE IS INTENDED TO DEVELOP AN UNDERSTANDING OF THE BASIC PRINCIPLES OF DRAWING USING A RANGE OF MEDIA TO RECORD AND COMMUNICATE VISUAL INFORMATION**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	**Know how to develop analytical drawing skills**					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 2			Drawing Studio Donkeys Presentation – text and images. Exemplar materials. Soft pencil and paper.	1.1 Demonstrate how drawing is used as a method of communication. 1.2 Apply mark making, line, pattern, texture etc. in producing drawings 1.3 Select materials used for artistic production and the application of freehand drawing techniques.	• Guide students to demonstrate how drawing is used as a method of communication in various occupations • Illustrate with examples different drawing styles • Display materials used for artistic production • Guide student to produce portfolio and how to store it.	• List five occupations that use drawing as a means of communication • Use mark, line, pattern, texture etc. to produce drawings • Produce drawing portfolio
GENERAL OBJECTIVE 2	**Undertake Pencil Sketching**					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
3 – 4			Drawing Studio Donkeys Presentation – text and images. Exemplar materials. Soft pencil and paper.	2.1 Demonstrate simple freehand drawing pencil sketches 2.2 Illustrate practical application of freehand drawing techniques. 2.3 Sketch planar shapes, 3-D shapes, using pencil tonal effects.	• Guide the student to produce line drawings. • Show the strengths and weaknesses of student's work • Guide student to sketch planar shapes, 3-D shapes, using pencil tonal effects.	• Explain simple freehand drawing pencil sketches • Explain practical application of freehand drawing techniques • Draw planar shapes, 3-Dshapes and pencil tonal effects
GENERAL OBJECTIVE 3	**Undertake the Principle of Line Weight and shading in sketching**					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
5 – 6				3.1 Illustrate the principle of line and shading in sketches 3.2 Demonstrate the use of denote line thickness and shading in sketching	• Guide student to demonstrate the principle of line and shading in sketches • Guide students to	• Explain the principles of line and shading in sketches • Describe the use of denote line thickness

					identify tonal effects in graphical production. • Guide students how to use cross-hatching, erasure technique and pointillism technique on sketches.	and shading in sketching.
GENERAL OBJECTIVE 4		**Produce sketches using Pen and ink**				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
7 – 8			Papers, sketch boards, pens of various sizes, ink of different colours	4.1 Demonstrate the Production of 2D sketches using pen and ink 4.2 Perform simple 3D sketches using pen and ink	• Guide student to sketch 2 and 3-D shapes using pens and ink lines methods in cross-hatching and pointillism.	• Sketch a 2-D using pen and ink • Sketch a 3-D using pen and ink
GENERAL OBJECTIVE 5		**Draw perspectives**				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9 – 10			Marker board Sketch boards and accessories Drawing papers.	5.1 Demonstrate single and two point perspective in drawings	• Guide student to draw perspective views using various methods of production such as one and two point perspective	• Produce drawings in two point perspective
GENERAL OBJECTIVE 6		**Use a range of drawing media in exploring drawing as a means of communicating visual information.**				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
11 – 12			Educational CD. Audio Visual Projection system. Mixed media – Coloured pencils, water colour, marker pens, pastels, ink etc.	6.1 Identify the different drawing media as a means of visual communication 6.2 Demonstrate "Rendering" as a means of visual communication 6.3 Demonstrate the use of media to record and/ or communicate a given subject. 6.4 Record colour, texture, shade and keep portfolio	• Guide the student to: • Demonstrate how to use drawing materials and media. • Perform "Rendering" production of freehand drawings using mixed media • Record colour, texture, shade and keep portfolio	• Produced rendered drawings and demonstrate the use of media to record and/ or communicate a given subject
GENERAL OBJECTIVE 7		**Produce simple still life and abstract sketches in colours**				

Week	Specific Learning Objectives	Teachers Activities	Learning Resources	Specific Learning Objectives	Teachers Activities	Evaluation
13 – 15			Educational CD. Audio Visual Projection system. Mixed media – Coloured pencils, water colour, marker pens, pastels, ink etc.	7.1 Demonstrate simple still life and abstract sketching monochromatically and multi-chromatically 7.2 Record colour, texture, shade and keep portfolio	• Guide student to produce still life and abstract sketches both monochromatically and multi-chromatically. • Examine student work for critique and evaluation.	• Carry out simple still life and abstract sketching

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 112)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	0%
Test	At least 2 progress tests for feedback.	30%
Practical	At least 5 home works to be assessed by the teacher	70%
TOTAL WEIGHT		**100**

PROGRAMME:	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**
COURSE NAME:	**BUILDING CONSTRUCTION 1**
COURSE CODE:	**ARC 113**
DURATION:	**1–2–3– 3**
CREDIT UNITS:	**3 UNITS**
GOAL:	This course is designed to acquaint students with the essential principles of Building Construction
GENERAL OBJECTIVES:	On completion of this course the Students should:

1) Know the various components of building and their different requirements
2) Understand the preliminaries involved in the construction of a building
3) Understand the general principles of selecting and preparing sites to receive various types of foundations.
4) Understand the principle of damp proofing in building

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 2 – 3 – 3**
COURSE TITLE	**BUILDING CONSTRUCTION 1**				**COURSE CODE**	**ARC 113**
GOAL	**THIS COURSE IS INTENDED TO INTRODUCE THE STUDENT TO THE ESSENTIAL PRINCIPLES OF BUILDING CONSTRUCTION**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Know the various components of building and their different requirements					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1-3	1.1 Define the term building components. 1.2 Enumerate the building components e.g. foundation, floor, wall, ceiling, roof, fenestrations, doors, windows, etc. 1.3 Identify the different requirements of building components.	• Explain the term building • List various types of building components and requirements.	• White board • Drawing Studio, • Power Point, • Projector • Construction sites	1.1 Illustrate with sketches the various building elements 1.2 Demonstrate the various building components and their position and relevance in building	• Sketch these various building components • Guide students to carry out good sketches of each component	• What are the various building element and their functional requirements? • List various building components • Draw various building components
GENERAL OBJECTIVE 2	Understand the preliminaries involved in the construction of a building					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
4-6	2.1 List the site activities, which precede the actual building construction. 2.2 Explain the importance for the provision of the following facilities on site: • temporary services • roads • materials storage accommodation • Site sheets • offices 2.3 Explain factors to be considered in site organization and layout. 2.4 Describe the process of setting out a building using the following: • 3,4,5, method • builder's square method • theodolite method	• Explain the site activities, which precede the actual building construction. and the importance for the provision of the following facilities on site: • temporary services • roads • materials storage accommodation • Site sheets • Offices • Discuss each method with sketches	• White Board • Measuring tape • Builders square • Theodolite, • pegs & relevant text books	2.1 Illustrate activities/services that precede the actual building construction with a good site Layout. 2.1 Demonstrate the various site activities before construction. 2.2 Demonstrate the importance of services, access ways, store, site office at construction site 2.3 Demonstrate how to organize a site and set out a building on a giving site 2.4 Demonstrate each method of setting out	• Engage students on site visits to see physical activities at site. • Carry out assignments on proposed location of each on a giving site • Guide students on organization and setting out of building	• What are the preliminary site activities? • What is the importance of preliminary site activities? • What are the factors to be considered in site organization and layout. • Explain the site activities which precede the actual building construction.

GENERAL OBJECTIVE 3		Understand the general principles of selecting and preparing sites to receive various types of foundations.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
7 – 10	3.1 Explain the methods of excavation 3.2 List the tools used in manual method of excavation. 3.3 Describe the principal equipment used in excavation. 3.4 Explain with sketches the different methods of earthwork support to trenches in different types of soils. 3.5 Define the term foundation. 3.6 Explain the importance of foundation to building structure. 3.7 List the various types of soils and how they affect choice of foundation 3.8 Describe the different types of foundations and their applications 3.9 Describe the different types of foundations and their applications 3.10 Explain the methods of construction of the various types of foundations	• Explain the methods of excavation. • Enumerate the tools used in manual method of excavation • Explain the principal equipment used in excavation • Explain with sketches the different methods of earthwork support to trenches in different types of soils. • Explain foundation and the importance to building structure • Explain various types of soil as they affect the of foundation • Explain the different types of foundation and their applications . • Explain the methods of construction of the various types of foundations	• White Board • Shovel • Spade • Excavator • Relevant text books etc.	3.1 Identify various manual excavation tools 3.2 Differentiate types of soils. 3.3 Illustrate foundation of a building 3.4 Illustrate by simple calculate the area of concrete foundation 3.5 Illustrate trench excavation methods and excavation tools. 3.6 Illustrate various methods of earthwork support and the necessity for each 3.7 Illustrate various types of Foundation and understand the reason for each 3.8 Illustrate various methods of construction of foundations 3.9 Demonstrate various methods of earthwork support and the necessity for each 3.10 Illustrate the various types of Foundation and understand the reason for each	• Guide student through the calculation process. • Guide student on width and depth of excavation and tools for each type of foundation • Guide student to produce neat sketches • Arrange site visits for student • Guide student to produce good sketches of earthwork supports	• Explain excavation methods of a given building • List the tools used in manual method of excavation. • What are the principal equipment used in excavation? • Explain foundation and its importance • List various types of tools and how it affect the choice of foundation
GENERAL OBJECTIVE 4		Understand the principle of damp proofing in building				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
11 – 15	4.1 Describe the processes of the rising and seepage of ground and underground water. 4.2 Explain the importance of damp-proofing in structural works. 4.3 Identify the functions of	• Explain the rising and seepage of underground water • Explain the importance of damp proofing in structural works • Discuss various	• Marker Board • Exemplars • Relevant text books	4.1 Demonstrate the effect of rising water and importance of damp proofing during constructions 4.2 Show various types and properties of damp proofing materials in	• Guide students to identify different types of damp-proof foundations, blinding and anti-termite treatment and tanking.	• Explain the processes of the rising and seepage of ground and underground water • Explain types of foundations with

	damp-proof courses. 4.4 Explain the principle of tanking in basement works. 4.5 Explain the properties of damp-proofing materials in use. 4.6 Enumerate the various damp-proofing materials in use. 4.7 Explain the importance of hard-core. 4.8 Explain the use of blinding. 4.9 State the use of anti-termite treatment in foundation works.	functions of damp proof courses • Explain the principles of tanking in basement works • Discuss the properties of damp proofing materials in use • Discuss the various damp proofing materials in use • Explain hardcore and the importance • Explain blinding and its importance • Explain the use of anti-termite treatment in foundation works. • Illustrate each of 4.1 to 4.9 with appropriate sketches. • Discuss 4.1 to 4.9 with practical examples.		construction 4.3 Demonstrate with existing building and sketches the importance of damp-proofing, tanking, blinding, and anti-termite treatment 4.4 Illustrate simple methods of damp proofing in construction 4.5 Take students on a guided tour of construction sites 4.6 Demonstrate with existing building/or classroom how seepage of ground occur	• Guide students to demonstrate seepage of water in a soil using existing building/or classroom	examples, blinding, damp-proofing, tanking and anti-termite treatment and the relevant materials.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 113)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN INTERIOR DESIGN**

COURSE TITLE: **NIGERIAN TRADITIONAL ARCHITECTURE**

COURSE CODE: **ARC 114**

DURATION: **2 –0 – 2– 2**

CREDIT UNITS: **2 UNITS**

GOAL: This course is designed to create awareness and appreciation of traditional architectural solutions and construction techniques.

GENERAL OBJECTIVES: On completion of this course the student will be able to:

1) Know the Factors that Influence various Traditional Solutions
2) Understand traditional responses to climate, culture and religion.
3) Appreciate the influence of traditional building materials on traditional architecture.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**2 –0 – 2 – 2**
COURSE TITLE	**NIGERIAN TRADITIONAL ARCHITECTURE**				**COURSE CODE**	**ARC 114**
GOAL	**THIS COURSE IS INTENDED TO CREATE AWARENESS AND APPRECIATION OF TRADITIONAL ARCHITECTURAL SOLUTIONS AND CONSTRUCTION TECHNIQUES.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Know the Factors that Influence various Traditional Solutions					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 4	1.1 Identify the various ways of building in the pre-colonial traditional setting. 1.2 Name the factors that contributed to the evolution of these various traditional solutions e.g. culture religion, climate, available materials etc. 1.3 Recognize how the factors in 1.2 above have influenced the evolution of the various architectural solutions. 1.4 Identify the merits and demerits of the various solutions.	• Explain 1.1 to 1.4 by the use of audio-visual equipment in the classroom. .	Computer Internet Audio Visual Equipment Slide projector Overhead projectors Transparencies Marker board			• What are the various ways of setting building in the pre-colonial tradition? • Explain three factors that contributed to the evolution traditional solutions. • What are the merits and demerits of the various solutions.
GENERAL OBJECTIVE 2	Understand traditional responses to climate, culture and religion.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
5 – 10	2.1 Explain the concept of courtyards in traditional responses to architecture. 2.2 Describe the application of courtyard concepts to the culture of peoples of Nigeria. 2.3 Identify the types of courtyards used in the traditional setting. 2.4 Describe the sequence of spaces in a traditional village setting and the various traditional settlement patterns. 2.5 List the origin and	• Explain the concept of courtyards in traditional responses. • Discuss the types of courtyards used in the traditional setting. • Explain the sequence of spaces in a traditional village setting and the various traditional settlement patterns. • Explain the origin and evolution of traditional architectural forms • Explain the idea	Computer Internet Audio Visual Equipment Slide projector Overhead projectors Transparencies.			• Explain the application of courtyard concepts to the culture of peoples of Nigeria. • Relate the concept of courtyards in traditional responses to architecture. • What are the sequence of space in a traditional village setting .

	evolution of traditional architectural forms. 2.6 Explain the idea behind the following traditional forms: Rectilinear and Curvilinear forms, conical roofs mono-pitched and double-pitched roofs.	behind the following traditional forms: Rectilinear and Curvilinear forms, conical roofs mono-pitched and double-pitched roofs.				
GENERAL OBJECTIVE 3		Appreciate the influence of traditional building materials on traditional architecture.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
	3.1 Define the influence of traditional building materials on traditional architecture 3.2 Explain the limitations of available local materials and building techniques on traditional architecture. 3.3 List the traditional materials used for furnishing and the methods of applying them. 3.4 Differentiate the traditional building techniques and contemporary construction methods giving their merits and demerits. 3.5 Enumerate the influences of modern materials and technology on traditional architecture in Nigeria.	• Explain the influence of traditional building materials on traditional architecture e.g. wood, thatch, earth, stone, bamboo, raffia etc. • Explain the limitations of available local materials and building techniques on traditional architecture • Discuss the traditional materials used for furnishing and the methods of applying them. • Explain the traditional building techniques and contemporary construction methods giving their merits and demerits. • Explain the influences of modern materials and technology on traditional architecture in Nigeria.	Audio Visual Equipment Slide projector Overhead projectors Transparencies Marker board			• What are the influence of traditional building materials on traditional architecture? • Outline briefly the traditional materials used for furnishing and the methods of applying them. • Itemize the influences of modern materials and technology on traditional architecture in Nigeria

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 114)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	60%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 3 home works to be assessed by the teacher	20%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **MATHEMATICS FOR ARCHITECTURE STUDENTS I**

COURSE CODE: **ARC 115**

DURATION: **2 –0 – 2 – 2**

CREDIT UNITS: **2 UNITS**

GOAL: This course is designed to introduce students to the fundamentals of equations, charts and graphs and their application in Engineering and Architectural solutions

GENERAL OBJECTIVES: On completion of this course the students will be able to:

1) Understand Principles underlying the construction of Charts and graphs
2) Understand the basic concepts and manipulation of vectors and their applications to the solutions of engineering problems
3) Understand the Concept of equations and apply same to engineering problems
4) Understand the definition, manipulation and application of trigonometric functions
5) Understand the use and the importance of some measures of central tendency in summarizing data

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PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**2 –0 – 2 – 2**
COURSE TITLE	**MATHEMATICS FOR ARCHITECTURE STUDENTS I**				**COURSE CODE**	**ARC 115**
GOAL	**THIS COURSE IS INTENDED TO INTRODUCE THE STUDENT TO FUNDAMENTALS OF EQUATIONS, CHARTS AND GRAPHS AND THEIR APPLICATION IN ENGINEERING AND ARCHITECTURAL SOLUTIONS**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Understand Principles underlying the construction of Charts and graphs					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 3	1.1 Reproduce graphs of functions fractions such as $Y = ax^n + b, n = 1,2$ $Y = CST (a+x)$ $Y = ax^k$, including cases of assembles. 1.2 Apply knowledge from 1.1 in determination as laws from experimental data 1.3 Construct graphs of functions and fractions, with examples	• Explain how graphs are produced from functions fractions • Explain how laws are determined from experimental data • Describe how graphs of functions fractions are constructed	Relevant Textbooks, Calculators, Lecture notes, Graph sheets, PowerPoint, Presentation and AV Projection equipment. Exemplars			• Construct graph of functions fractions of $Y = ax^n + b, n = 1,2$ $Y = CST (a+x)$ $Y = ax^k$, including cases of assembles. • Determine laws from experimental data • Give examples of graphs of functions fractions
GENERAL OBJECTIVE 2	Understand the basic concepts and manipulation of vectors and their applications to the solutions of engineering problems					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
4 – 10	2.1 State the definitions and representations of vectors. 2.2 Define the position vector. 2.3 Label unit vector 2.4 Define scalar multiple of a vector 2.5 List the characteristics of parallel vectors 2.6 Name quantities that may be classified as vector. 2.7 Compute the modulus of any given vector up to 2 and 3 dimensions 2.8 State the parallelogram law in solving problems including addition and subtraction of vectors 2.9 Apply the parallelogram law in solving problems including addition and subtraction of vectors.	• Explain the definition of vectors • Describe vectors representations • Explain scalar multiple of a vector • Discuss the characteristics of parallel vectors • State the quantities that may be classified as vector • Explain the modulus of any given vector up to 2 and 3 dimensions • forces. • Explain and Illustrate activities 2.9 to 2.21 with relevant examples	Relevant Textbooks, Calculators, Lecture notes, PowerPoint Presentation and AV Projection equipment. Exemplars			• Calculate the modulus of any given vector of 2 and 3 dimensions • Apply the parallelogram law to solve the problems of addition and subtraction of vectors. • Calculate coplanar forces acting at a point using algebraic and graphical methods. • Calculate the relative velocity using vectoral techniques.

	2.10 Explain the concept of components of a vector and the meaning of orthogonal components. 2.11 Resolve a vector into its orthogonal components. 2.12 List characteristics of coplanar localized vectors. 2.13 Define the resultant or composition of coplanar vectors. 2.14 Compute the resultant of coplanar forces acting at a point using algebraic and graphical methods. 2.15 Apply the techniques of resolution and resultant to the solution of problems involving coplanar forces. 2.16 Apply vectoral techniques in solving problems involving relative velocity. 2.17 State the scalar product of two vectors. 2.18 Compute the scalar product of given vectors. 2.19 Define the cross product of the vector product or two vectors. 2.20 Calculate the direction ratios of given vectors. 2.21 Calculate the angle between two vectors using the scalar product					
GENERAL OBJECTIVE 3		Understand the Concept of equations and apply same to engineering problems				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
11	3.1 List the concept of equation, i.e. A = B where A and B are expressions. 3.2 List different types of equations: - Linear, Quadratic, Cubic, etc.	• Explain the concept of equation, ie. A = B where A and B are expressions by lecture. • Give relevant examples and	Relevant Textbooks, Calculators, Marker Board, Lecture notes, PowerPoint Presentation and AV Projection equipment.			• List and give examples of of the different type of equations: Linear, Quadratic and Cubic.

	3.3 State examples of Linear Simultaneous equations with two unknowns and Simultaneous equations with at least one quadratic equation. 3.4 Apply algebraic and graphical methods in solving two Simultaneous equations involving a Linear equation and a Quadratic equation. 3.5 Apply the algebraic and graphical methods in solving two simultaneous quadratic equations. 3.6 Define a determinant of n^{th} order. 3.7 Apply determinants of order 2 and 3 in solving Simultaneous Linear equations.	assignments	Exemplars			
GENERAL OBJECTIVE 4		Understand the definition, manipulation and application of trigonometric functions				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
12 – 13	4.1 Define the basic trigonometric ratios, sine, cosine and tangent of an angle. 4.2 Derive the other trigonometric ratios; cosecant, secant and cotangent using the basic trigonometric ratios in 4.1 above. 4.3 Derive identities involving the trigonometric ratios of the form; $Cos^2\theta + Sin^2\theta = 1$, $Sec^2\theta = 1 + tan^2\theta$, etc. 4.4 Derive the compound angle formulae for sin (A+B), Cos (A+B) and Tan (A+B).	• Explain and Illustrate activities 4.1 to 4.4 with relevant examples	Relevant Textbooks, Calculators, Marker Board, Lecture notes, PowerPoint Presentation and AV Projection equipment. Exemplars			• Using the basic trigonometric ratios calculate the sine, cosine and tangent of a given angle • Calculate the trigonometric ratios of the form: $Cos^2\theta + Sin^2\theta = 1$, $Sec^2\theta = 1 + tan^2\theta$

GENERAL OBJECTIVE 5		Understand the use and the importance of some measures of central tendency in summarizing data				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
14 – 15	5.1 Define Arithmetic mean, Geometric Mean, Median, Mode and Harmonic mean 5.2 Compute the measures in 5.1 above given: i. ungrouped data ii. grouped data 5.3 Explain the uses of Arithmetic and Geometric means 5.4 Calculate: Quantiles Deciles, Percentiles given a set of data 5.5 List the merits and demerits of all the above measures of central tendency.	• Explain and Illustrate activities 5.1 to 5.5 • Explain the merits and demerits of all the above measured of central tendency.	Relevant Textbooks, Calculators, Marker Board, Lecture notes, PowerPoint Presentation and AV Projection equipment. Exemplars			• Calculate Arithmetic mean, Geometric Mean, Median, Mode and Harmonic mean. • Explain the uses of Arithmetic and Geometric means

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	**PURPOSE AND NATURE OF ASSESSMENT (ARC 115)**	**WEIGHING**
Examination	Final Examination (written) to assess knowledge and understanding	60%
Test	At least 2 progress tests for feedback.	10%
Practical	At least 5 home works to be assessed by the teacher	30%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN INTERIOR DESIGN**

COURSE TITLE: **BUILDING SCIENCE**

COURSE CODE: **ARC 116**

DURATION: **2 –0 – 2 – 2**

CREDIT UNITS: **2 UNITS**

GOAL: This course is designed to acquaint students with various climates and their effects on buildings and the environments.

GENERAL OBJECTIVES: On completion of this course the trainee will be able to:

1) Understanding dynamics using Newton's Law of motions
2) Understanding the basic principles of sound insulation and Acoustics
3) Understand the characteristics of light and Derive Sabire Formular
4) Understand the effects of climatic elements on buildings
5) Understand the effect of building orientation and weather control in buildings
6) Understand microclimate effects on buildings.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**2 –0 – 2 – 2**
COURSE TITLE	**BUILDING SCIENCE**				**COURSE CODE**	**ARC 116**
GOAL	**THIS COURSE IS INTENDED TO ACQUAINT THE STUDENT WITH VARIOUS CLIMATES AND THEIR EFFECTS ON BUILDINGS AND THE ENVIRONMENTS**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Understanding dynamics using Newton's Law of motions					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1-2	1.1 Explain thermal conductivity 1.2 Describe the principles of heat transmission 1.3 Explain heat transmission coefficient	• Explain thermal conductivity • Explain the principles of heat transmission • Explain heat transmission coefficient	Computer Internet Audio Visual Equipment Slide projector Overhead projectors Transparencies Marker board			• What is thermal conductivity? • What are the principles of heat transmission? • Briefly explain heat transmission coefficient.
GENERAL OBJECTIVE 2	Understanding the basic principles of sound insulation and Acoustics					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
	2.1 Explain the principles of sound transmission 2.2 Describe the characteristic of sound, frequency, pitch, reflection intensity etc.	• Explain the principles of sound transmission • Explain the characteristic of sound , frequency, pitch, reflection, intensity, etc	Marker board Turning fork			• List the characteristics of the following; sound, frequency, pitch, reflection and intensity.
GENERAL OBJECTIVE 3	Understand the characteristics of light and Derive SabireFormular					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
3-4	3.1 Explain the characteristics of light-frequency, wave-length, and spectrum. 3.2 2Discuss natural and artificial lighting of a space.	• Explain 3.1 - 3.2 using equations and prism	Computer Internet Audio Visual Equipment Slide projector Overhead projectors Transparencies. Marker board Prism			•
GENERAL OBJECTIVE 4	Understand the effects of climatic elements on buildings					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
5-7	4.1 Explain the effect of rain, water vapour, temperature, wind and solar radiation in buildings and its occupants.	• Explain the effect of rain, water vapour etc. with the aid of examples and sketches.	Marker board Audio Visual Equipment Slide projector			• Enumerate the effects of rain, water vapour, temperature, wind and solar radiation in buildings

						and its occupants.

GENERAL OBJECTIVE 5		Understand the effects of climatic elements on buildings				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9-12	5.1 Explain how wind direction and driving rain affect a building. 5.2 Describe how the sun directions affect the building and its orientation. 5.3 Explain using a suitable shading devices and orientation to eliminate the sun and driving rain.	• Explain, with the aid of appropriate sketches and examples, how wind direction and driving rain affect a building. • Explain with the aid of appropriate sketches and examples, how the sun directions affect the building and its orientation. 5.4 Explain using a suitable shading devices and orientation to eliminate the sun and driving rain.	Computer Internet Audio Visual Equipment Slide projector Overhead projectors Transparencies. Marker board			• Explain how can wind direction and driving rain affect a building? • Explain how sun direction affect the building and its orientation?
GENERAL OBJECTIVE 6		Understand micro-climate effects on buildings.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
13-15	6.1 Explain the effect of a hill, large water body and built up surroundings on the climate of the surroundings. 6.2 Describe the different climatic zones in Nigeria and how it affect the structure of buildings in the zones	• Explain, with the aid of appropriate sketches effect of a hill, large water body and built up surroundings on the climate of the surroundings • Explain 6.2 with appropriate diagrams and pictorial evidences.	Computer Internet Audio Visual Equipment Slide projector Overhead projectors Transparencies Marker board Projector Maps			• Explain the different climatic zones in Nigeria and how it affect the structure of buildings in the zones

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 116)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	60%

Test	At least 2 progress tests for feedback.	30%
Practical	At least 2 home works to be assessed by the teacher	10%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN INTERIOR DESIGN**

COURSE TITLE: **SURVEYING FOR ARCHITECTURE STUDENTS**

COURSE CODE: **ARC 117**

DURATION: **1–2– 3 – 3**

CREDIT UNITS: **3 UNITS**

GOAL: This course is designed to acquaint students with simple surveys, basic survey instruments and their application in setting out of buildings.

GENERAL OBJECTIVES: On completion of this course the trainee will be able to:

1) Use Linen and steel tapes in making linear measurements
2) Know the principles of measurement of angles with theodolites and bearings with a magnetic compass
3) Understand Tertiary Levelling
4) Understand the principles of survey computations and plotting
5) Know how to read, interpret make measurement from maps, layout and engineering plan
6) Understand problems involved in producing contoured plans
7) Understand setting in out procedure for a medium sized building including

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 2 – 3 – 3**
COURSE TITLE	**SURVEYING FOR ARCHITECTURE STUDENTS**				**COURSE CODE**	**ARC 117**
GOAL	**THIS COURSE IS INTENDED TO ACQUAINT THE STUDENT WITH SIMPLE SURVEYS, BASIC SURVEY INSTRUMENTS AND THEIR APPLICATION IN SETTING OUT OF BUILDINGS**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Understand the use and methods of using Linen and steel tapes in making linear measurements					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 2	1.1 Define the following: a) Misalignment b) Slope c) Temperature d) Tension e) Standardization error on measured distances 1.2 Explain the effect of 1.1a to 1.1e	• Explain the following and their effects on a building: a) Misalignment b) Slope c) Temperature d) Tension e) Standardization error on measured distances	• Tapes • Chains • Ranging rods • Field book • Drawing sheets	1.1 Apply the corrections listed in 1.1 above. 1.2 Demonstrate the use of chain surveying instruments e.g. Linen tapes, steel tapes, ranging rods. 1.3 Identify the necessary precautions in the use of the above instruments. 1.4 Demonstrate the criteria for selection of survey lines and offsets and the limitations on lengths. 1.5 Demonstrate the methods of making linear measurements in chain surveys - both along the survey line and along offsets. 1.6 Illustrate limiting conditions on measurement accuracy on 1.5 above. 1.7 Identify common errors in chain surveying and their sources e.g. squaring of building corners, wrong booking of values. 1.8 Demonstrate with sketches the basic methods of check or proof lines, the use of control frame work for position and orientation. 1.9 Demonstrate the general	• Guide students to identify chain surveying instruments • Guide students to identify necessary precaution in the use of surveying instruments • Guide students to select survey lines and offsets and the limitations on lengths. • Guide students to sketch the basic methods of check or proof lines, the use of control frame work for position and orientation • Guide students to carry out survey of an area of at least one hectare. • Guide students to draw to field standards using conventional signs and hand lettering	• Explain common errors in chain surveying and their sources e.g. squaring of building corners, wrong booking of values. • Describe the general procedure for carrying out a chain survey.

				procedure for carrying out a chain survey. 1.10 Illustrate the method of booking field measurements in chain surveys. 1.11 Demonstrate field problems and methods of overcoming them. 1.12 Identify errors in simple chain surveys. 1.13 Carry out survey of an area of at least one hectare. 1.14 Book all field measurements. 1.15 Illustrate Plot survey at a suitable scale. 1.16 Draw to field standards using conventional signs and hand lettering		
GENERAL OBJECTIVE 2		Understanding the principles of measurement of angles with theodolites and bearings with a magnetic compass				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
3 – 4	2.1 Explain the basic principles of ordinary spirit levelling and digital spirit levelling. 2.2 Iist the specifications of tertiary levelling. 2.3 Explain the (optimum) observing procedure 2.4 Explain the use and criteria for selections of levelling datum. 2.5 Describe collimation error in level. 2.6 Explain the construction and use of semi-permanent and permanent tertiary bench-marks	Explain the basic principles of ordinary spirit levelling and digital spirit leveling, the specifications of tertiary levelling. Explain the (optimum) observing procedure And the use of and criteria for selections of levelling datum. Explain the collimation error in level and the construction and use of semi-permanent and permanent tertiary bench-marks	• Compass • Theodolite • Targets • Level instruments	• Perform the basic principles of ordinary spirit levelling and digital spirit levelling. • llustrate the specifications of tertiary levelling. • Illustrate the (optimum) observing procedure • Demonstrate the use of and criteria for selections of levelling datum. • Illustrate collimation error in level. • Illustrate the construction and use of semi-permanent and permanent tertiary	• Organize site visit • Guide students to perform the basic principles of ordinary spirit levelling and digital spirit levelling. • Guide students to appreciate the uses of tertiary levelling	• Describe the construction and use of semi-permanent and permanent tertiary bench-marks. • Carry out tertiary levelling, reduction and adjustment to produce elevations of all permanent stations along a circuit of about 2km, using ordinary and digital levels.

				bench-marks. • Demonstrate Book field observations. and reduce level. Explain arithmetical checks in level reduction. Illustrate tertiary levelling, reduction and adjustment to produce elevations of all permanent stations along a circuit of about 2km, using ordinary and digital levels. Demonstrate the uses of tertiary levelling		
GENERAL OBJECTIVE 3		Understand Tertiary Levelling				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
5 – 6	3.1 Describe the various units of angular measure e.g degrees grads and radian measures, working out their conversion factors. 3.2 Explain the working principles of a surveyors' (Prismatic) compass. 3.3 Describe the procedure of observation with a surveyors' (Prismatic) compass	• Explain the various units of angular measure e.g degrees grads and radian conversion factors • Explain the working principles of a surveyors' (Prismatic) compass. • Discuss the procedure of observation with a surveyors' (Prismatic) compass	• Levels of various types • Staff. • Prismatic compass • Compass • Theodolite • Targets	3.1 Illustrate the method of observation with a theodolite. 3.2 Illustrate the difference in the reading procedure of a theodolites 3.3 Perform out angular measurements with prismatic compass and theodolites. 3.4 Show students the working of the listed equipment to the student	• Organize site visit • Guide students to differentiate the reading procedure of a theodolite • Guide student to observe the working of the equipment	• Explain the working principles of a surveyors' (Prismatic) compass. • Carry out angular measurements with prismatic compass and theodolites.
GENERAL OBJECTIVE 4		Understand the principles of survey computations and plotting				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
7 – 8			• Calculators • Computer	4.1 Reduce the measured field data with a theodolite to obtain required angles. 4.2 Deduce bearings from the obtained angles. 4.3 Adjust compass bearings of the compass surveyed area.	• Guide student to undertake these exercises (4.1 to 4.7)	• Plot the plan of a surveyed area manually at different scales (small, medium and large

				4.4 Carryout the computation of 5.5 above. 4.5 Retrieve the measured field data of the surveyed area by a total station onto a PC. 4.6 Process the data using the PC. 4.7 Plot the plan of the surveyed area manually at different scales (small, medium and large		
GENERAL OBJECTIVE 5		Know how to read, interpret make measurement from maps, layout and engineering plan				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9 – 10	5.1 State the uses of different types of map e.g atlas, geographical, topographical, and engineering and guide maps. 5.2 Explain the principles of map scale. 5.3 State the relationships between map scales or representative fractions and the contour interval. 5.4 Identify map symbols and conventional signs. 5.5 Explain their basis and use. 5.6 Identify various Nigerian map series. 5.7 Use map catalogues. 5.8 Describe various methods of showing relief on maps e.g. spot 5.9 Define map grids. 5.10 Explain how to establish different reference directions true north, grid north and magnetic north. 5.11 Define the relationship between the different	• Explain 5.1 to 5.15 using relevant examples and maps	• Examples of various types of maps • Marker board • And all its accessories • Set of maps for student exercises. • Drawing instruments, protractors dividers, Parallel rule, Scale rules	5.1 Use map catalogues	• Guide students to use maps and catalogues using relevant maps for the exercises	• State the relationships between map scales or representative fractions and the contour interval. • Illustrate how to establish different reference directions true north, grid north and magnetic north.

	directions i.e convergence, declination and compass variation. 5.12 Interpret different types of map, layout plans and diagrams/sketches. 5.13 Identify simple plan metric details on imageries. 5.14 Determine radius of curves from given diagram.. 5.15 Describe different map reference system					
GENERAL OBJECTIVE 6		Understand problems involved in producing contoured plans				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
11 – 12	6.1 Name the different reference directions for contoured plan. 6.2 Explain basic need for heights in topographical Engineering and Township Surveys plans. 6.3 6.4 Describe the use of grids of levels.	• Describe the different reference directions for contoured plan • Explain basic need for heights in topographical Engineering and Township Surveys plans. • Explain basic need for heights in topographical Engineering and Township Surveys plans.	• Marker board • Levels • Theodolite	6.1 Use map grids 6.2 Scale off grid coordinates 6.3 Measure distances from maps and plans 6.4 Read off directions/bearing between given features 6.5 Illustrate optimum distribution of spot heights for contoured 6.6 Carry out contouring at 0.5m vertical interval from a mesh of spot heights. 6.7 Illustrate optimum distribution of spot heights for contoured 6.8 Carry out contouring at 0.5m vertical interval from a mesh of spot heights.	• Guide student to perform the stated objectives (6.1 to 6.8)	• Name the different reference directions for contoured plan. • Carry out contouring at 0.5m vertical interval from a mesh of spot heights.
GENERAL OBJECTIVE 7		Understand setting in out procedure for a medium sized building including				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
13 – 15	7.1 Explain how to set-out a building and the accompanying constraints. 7.2 Identify the equipment required to set-out a building with accompanying access	• Explain how running internal and external measurements are taken horizontally and vertically. • Use appropriate pictorial information to illustrate	• Theodolite • Total Station • Optical Plumb • Plumb-bob	7.1 Set-out a building with accompanying access roads. 7.2 Determine the areas of a building and its site. 7.3 Calculate suitable length of a traveler and reduced	• Guide students to use relevant equipment supervise the students set out a building	• Explain how running internal and external measurements are taken horizontally and vertically. • Establish sight rails

	roads. 7.3 Explain how profiles are used to control. 7.4 Identify the instruments used for taking internal and external dimensions. 7.5 Define how running internal and external measurements are taken horizontally and vertically. 7.6 State the procedure for checking vertically a building using Theodolite, Optical Plumb, and Plumb-bob. 7.7 Explain how running internal and external measurements are taken horizontally and vertically. 7.8 State the procedure for checking vertically a building using Theodolite, Optical Plumb, and Plumb-bob. 7.9 Describe the invert of a drain, a sight rail and a traveler			levels of sight rails from given drawings. 7.4 Establish sight rails for horizontal and depth control of a straight drain between manholes.		for horizontal and depth control of a straight drain between manholes.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 117)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **WORKSHOP PRACTICE 1**

COURSE CODE: **BLD 105**

DURATION: **0–4– 4 – 4**

CREDIT UNITS: **4 UNITS**

GOAL: This course is designed to introduce students to the essential principles of Building Construction

GENERAL OBJECTIVES: On completion of this course the trainee will be able to:

1) Know block-laying and Concreting Tools, equipment and their uses and maintenance Procedure
2) Understand Factory Acts and Safety regulations Applicable in the block-laying and concreting workshop
3) Know blocks and concrete materials.
4) Understand the various methods of block & Bricklaying and concreting
5) Know different types of brick and block walls and their types of bonds

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**0 – 4 – 4 – 4**
COURSE TITLE	**WORKSHOP PRACTICE 1**				**COURSE CODE**	**BLD 105**
GOAL	**THIS COURSE IS INTENDED TO INTRODUCES THE STUDENT TO THE ESSENTIAL PRINCIPLES OF BUILDING CONSTRUCTION**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Know Blocklaying and Concreting Tools, equipment and their uses and maintenance Procedure					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 3			• Marker board • Equipped Block laying and concrete workshop • Overhead projector • Videos and Exemplars	1.1 Select bricklaying and concreting tools and equipment such as Block laying trowel, pointing trowel, spirit level, builders square, straight edge (range), wooden float, concrete mixers, vibrators, concrete forms, and block molding machines for specific job requirements. 1.2 Use the tools and equipment in 1.1 above. Maintain the tools and equipment in 1.1 above select, cutting and plastering tools such as club hammer, bolster chisel, cold chisel, brick saw; and hark saw for specific job requirements	• Guide students how to select, use of various bricklaying and concreting tools. • Guide students how to use cutting and plastering tools. • Guide students how to carry out maintenance of the tools	• List various types of bricklaying and concreting tools and equipment known to you • How do you maintain bricklaying and concreting tools and equipment?
GENERAL OBJECTIVE 2	Understand Factory Acts and Safety regulations Applicable in the block-laying and concreting workshop					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
4 – 6			• Marker board • Equipped Block laying and concrete workshop • Overhead projector • Videos and Exemplars	2.1 Choose adequate ventilation for the workshop 2.2 Create safe storage of tools and first aid equipment 2.3 Demonstrate general safety habits with respect to the equipment 2.4 Demonstrate the layout of an ideal block-laying and concreting workshop	• Guide the student how to create safe storage of tools and first aid equipment. • Organize site visit on how to how to layout block laying and concreting workshop.	• Illustrate the layout of an ideal block-laying and concreting workshop • Sketch a block laying and concreting layout
GENERAL OBJECTIVE 3	Know blocks and concrete materials.					

Week	Specific Learning Objectives	Teachers Activities	Learning Resources	Specific Learning Objectives	Teachers Activities	Evaluation
7 – 10			• Marker board • Equipped Block laying and concrete workshop • Overhead projector • Videos and Exemplars	3.1 Differentiate between various types of fine aggregates, coarse aggregate, blocks, concrete and additives. 3.2 Illustrate types of concrete products 3.3 Select suitable aggregates for different kinds of construction works. 3.4 Perform various tests on blocks and concrete material.	• Show different types of fine and coarse aggregates, blocks, concrete and additives. • Show how to carry out tests on blocks and concrete • Guide students how to carry out various tests on blocks and concrete materials.	• What is the different between fine and coarse aggregate? • List concrete products •
GENERAL OBJECTIVE 4	Understand the various methods of block & Bricklaying and concreting					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
11 – 13			• Marker board • Equipped Block laying and concrete workshop • Overhead projector • Videos and Exemplars	4.1 Lay blocks of various types and sizes 4.2 Lay wet concrete for simple slabs, beams and lintels. 4.3 Carry out various ways of vibrating, finishing and curing concrete	• Guide the students how to: • lay blocks of various types and sizes. • cast concrete slabs beams and lintels • vibrating, finishing and curing concrete	• What are the various sizes and types of blocks
GENERAL OBJECTIVE 5	Know different types of brick and block walls and their types of bonds					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**
14 – 15			• Marker board • Equipped Block laying and concrete workshop • Overhead projector • Videos and Exemplars	5.1 Construct various types of bonds in a block work and brickwork. 5.2 Construct block walls of different thickness.	• Guide students how to construct various types of bonds in a block work and brick work. • Engage students to construct	• What is a boud? • Enumerate various types of bond .

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (BLD 105)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

ARCHITECTURAL TECHNOLOGY

ND I

SECOND SEMESTER COURSES

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **ARCHITECTURAL DESIGN 1**

COURSE CODE: **ARC 121**

DURATION: **1 – 3 – 4 – 4**

CREDIT UNITS: **4 UNITS**

GOAL: This course is designed to introduce students to architectural design through studio exercises and lectures dealing with Function, form and aesthetics.

GENERAL OBJECTIVES: On completion of this course the student should be able to:

1) Demonstrate problem solving in simple design
2) Understand the general space requirements in a simple building
3) Understand how to prepare presentation drawings for the selected design in '1' above
4) Prepare simple visual Presentation Drawings
5) Produce models and axonometric views
6) Propose simple design solutions

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 3 – 4 – 4**
COURSE TITLE	**ARCHITECTURAL DESIGN 1**				**COURSE CODE**	**ARC 121**
GOAL	**THIS COURSE IS DESIGNED TO INTRODUCE THE STUDENT TO ARCHITECTURAL DESIGN THROUGH STUDIO EXERCISES AND LECTURES DEALING WITH FUNCTION, FORM AND AESTHETICS.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Demonstrate problem solving in simple design					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1-3	1.1 Explain the development of current design concepts and theories 1.2 Explain how to analyze design briefs 1.3 Describe the general space requirements for different functions in a simple building	• Explain design concepts and theories • Discuss the development of Design concepts and theories • Discuss various functional spaces in simple buildings such as snack bar, 2-bedroom bungalow, kiosk, convenience shops, etc.	• Marker board • Lecture notes • Drawing Studio • Projector, • Drawing papers • Clutch • Pencils • T-Square • Cleaners • Drawing Instrument	1.1 Develop a design brief for a simple building such as snack bar, 2-bedroom bungalow, kiosk, convenience shops, etc. 1.2 Show the functional spaces in a simple building 1.3 Show the Space requirements for different functions 1.4 Demonstrate the relationship between form and function in a simple building.	• Guide students how t design brief is formulated and analyzed • Guide student to design simple buildings such as snack bar, 2-bedroom bungalow, kiosk, convenience shops	• Describe Design Concepts and Theories • Discuss functional spaces in a simple building • Analyze simple design briefs • Explain space requirements for different functions • Discuss form and function in a simple building
GENERAL OBJECTIVE 2	Understand the general space requirements in a simple building					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
4 – 5			• Marker board • Drawing papers • Clutch • Pencils • Cleaners • T-Square • Drawing Instrument	2.1 Organize functional spaces of a simple building	• Guide student to organize functional spaces of a simple building	• Explain how to organize Functional spaces in a simple building
GENERAL OBJECTIVE 3	Understand how to prepare presentation drawings for the selected design in '1' above					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
6 – 7			• Marker board • Drawing papers • Clutch • Pencils • Cleaners • T-Square • Drawing Instrument	3.1 Prepare zoning and bobble diagrams showing functional relationship	• Guide student to prepare zoning and bobble diagrams showing functional relationship	• Explain Organize zoning and bubble diagrams • Explain functional relationships

GENERAL OBJECTIVE 4		Prepare simple visual Presentation Drawings				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
8 – 9			• Marker board • Drawing papers • Clutch • Pencils • Cleaners • T-Square • Drawing Instrument	4.1 Illustrate how to produce preliminary sketches in 2D for a simple building as selected in 1 above 4.2 Prepare visual/ client presentation 4.3 Produce preliminary sketches in 3D for a simple building as selected in 1 above	• Guide students how to produce 2D conceptual exploration using freehand sketches and sketch/ abstract models • Guide student to develop simple visual/ client presentation • Guide students to examine 3D conceptual exploration using freehand sketches and sketch/abstract models.	• Produce preliminary sketches in 2D • Make visual presentation • Produce preliminary sketches in 3D
GENERAL OBJECTIVE 5		Produce models and axonometric views				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
10 – 11			• Exemplars. • Drawing equipment • Cutting mats, • Scalpel knives • Steel rule • Samples • Finishes etc • Drawing Studio	5.1 Produce models and axonometric views	• Guide student to construct simple models • Guide student to produce axonometric views in the studio	• Make simple models • Produce simple axonometric views
GENERAL OBJECTIVE 6		Propose simple design solutions				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
			• Exemplars • Plans • Marker boards • Lecture notes • Pencils, cleaners • T-Square • Drawing Studio & Projector,	6.1 Illustrate simple design briefs 6.2 Show simple project/design briefs 6.3 Prepare visual/ client presentation drawings 6.4 Prepare visual presentation	• Guide students on simple design briefs • Lead discussion on project/design development • Engage student in verbal discussion and feedback on design	• Analyze simple design briefs • Produce simple design solutions • Carry out project development • Prepare client presentation/layout

			• Studio and sample board		briefs. • Illustrate sample boards • Demonstrate project development towards completion. • Illustrate presentation techniques and layout. • Assist in the production of a sample board. • Conduct design jury for the class to assess students work	• Produce visual presentation works

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 121)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **TECHNICAL DRAWING**

COURSE CODE: **ARC 122**

DURATION: **0 – 2 – 2 – 2**

UNITS: **3 UNITS**

GOAL: This course is designed to introduce students to the essential manual skills and conventions required to produce a range of technical drawings.

GENERAL OBJECTIVES: On completion of this course the student will be able to:

1) Know the use and care of the different drawing instruments, equipment and materials
2) Understand the essentials in graphical communication
3) Know the Construction of simple geometric figures and shapes
4) Know the Construction of isometric and oblique drawings and projections
5) Understand the Principles of orthographic projections
6) Understand the Intersections of regular solids

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**0 – 2 – 2 – 2**
COURSE TITLE	**TECHNICAL DRAWING**				**COURSE CODE**	**ARC 122**
GOAL	**This course is designed to introduce students to the manual skills and conventions required to produce a range of technical drawings.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Know the use and care of the different drawing instruments, equipment and materials					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
			• Drawing instruments, equipment and materials such as Scale Ruler, setsquares T-squares, pencils, drawing paper etc. • Marker board • Drawing paper	1.1 Use different types of drawing instruments, equipment and materials such as Scale Ruler, Setsquare, T-squares, Pencils, Drawing Paper etc. 1.2 Select the various instruments, equipment and materials base on their use. 1.3 Use the precautions necessary to preserve the items in 1.1 above. 1.4 Use each of the item in 1.1 above 1.5 Maintain the various instrument and equipment.	• Guide the students how to use and maintain various drawing instruments, equipment and materials.	• State the precautions necessary to preserve the following: - Scale Ruler - Setsquare, - T-squares - Pencils - Drawing Paper
GENERAL OBJECTIVE 2	Understand the essentials in graphical communication					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
2 – 5			• Drawing instruments, equipment and materials such as Scale Ruler, setsquares T-squares, pencils, drawing paper etc. • Marker board • Drawing paper	2.1 Illustrate graphics and the different types of graphical presentations on the Board. 2.2 Illustrate the various conventional representations in graphical production of construction lines, finished lines, hidden and overhead details, projections, center lines, break lines, dimensioning of plans, elevations and sections of objects. 2.3 Layout drawing sheets with the following. • Margin • Title block etc. 2.4 Illustrate the various	• Guide students to: • Identify different types of graphical presentation on the Board • Layout drawings sheets with Margin, Title block, etc	• Illustrate the various conventional representations in graphical production of construction lines, finished lines, hidden and overhead details, projections, center lines, break lines, dimensioning of plans, elevations and sections of objects.

				standards of drawing sheets. 2.5 Print letters and figures of various forms and characters. 2.6 Illustrate conventional signs and symbols. 2.7 Layout a given set of drawings on a given sheet using the conventional signs, symbols and appropriate lettering characters.		
GENERAL OBJECTIVE 3		Know the Construction of simple geometric figures and shapes				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
c6 – 9	3.1 Explain the purpose of geometrical construction in drawing. 3.2 Construct parallel and perpendicular lines. 3.3 Construct and bisect lines, angles and areas. 3.4 Divide a straight line into given number of equal parts. 3.5 Identify polygons (regular or irregular). 3.6 Construct regular polygons with: a) N sides in a given circle. b) A given side length and of N side on a straight line. 3.7 Illustrate a circle. 3.8 Explain the properties of a circle, e.g. radius, diameter, normal tangent, circumference etc. 3.9 Carry out simple geometrical constructions on circles e.g. a) the diameter of a circle	Explain the purpose of geometrical construction in drawing, parallel and perpendicular lines. Explain process of construct and bisect lines, angles and areas, a straight line into given number of equal parts. Explain polygons (regular or irregular), regular polygons with: c) N sides in a given circle. d) A given side length and of N side on a straight line and a circle. Explain the properties of a circle, e.g. radius, diameter, normal tangent, circumference etc. Explain ways to carry	• Drawing instruments, equipment and materials such as Scale Ruler, setsquares T-squares, pencils, drawing paper etc. • Marker board • Drawing paper	3.14Construct parallel and perpendicular lines. 3.15Construct and bisect lines, angles and areas. 3.16Divide a straight line into given number of equal parts. 3.17Identify polygons (regular or irregular). 3.18Construct regular polygons with: e) N sides in a given circle. f) A given side length and of N side on a straight line. 3.19Illustrate a circle. 3.20Carry out simple geometrical constructions on circles e.g. q) the diameter of a circle given the circumference r) the circumference of a circle of a given diameter s) a circle to pass through 3 points	• Show students how to construct simple geometrical figures and shapes. • Show students how to construct polygons • Show the different geometrical constructions on circles. • Guide students to construct an ellipse using the methods listed.	• Construct simple geometric figures

	given the circumference b) the circumference of a circle of a given diameter c) a circle to pass through 3 points d) a circle to pass through 2 points and touch a given line e) a circle to touch a given smaller circle and a given line f) Tangents to circles at various points g) An arc of known radius, tangent to two lines at an angle of less than and more than 900 h) An arc externally tangent to two circles i. Inscribing and exscribing circles 3.103.10 Illustrate an ellipse. 3.11Construct an ellipse by using: a) Trammel method. Concentric circle method.	out simple geometrical constructions on circles e.g. i) the diameter of a circle given the circumference j) the circumference of a circle of a given diameter k) a circle to pass through 3 points l) a circle to pass through 2 points and touch a given line m) a circle to touch a given smaller circle and a given line n) Tangents to circles at various points o) An arc of known radius, tangent to two lines at an angle of less than and more than 900 p) An arc externally tangent to two circles i. Inscribing and exscribing circles 3.123.10 Illustrate an ellipse. 3.13Construct an ellipse by using: b) Trammel method. Concentric circle method.		t) a circle to pass through 2 points and touch a given line u) a circle to touch a given smaller circle and a given line v) Tangents to circles at various points w) An arc of known radius, tangent to two lines at an angle of less than and more than 900 x) An arc externally tangent to two circles i. Inscribing and exscribing circles 3.213.10 Illustrate an ellipse. 3.22Construct an ellipse by using: c) Trammel method. d) Concentric circle method.		
GENERAL OBJECTIVE 4		Know the Construction of isometric and oblique drawings and projections				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**

10 – 11			• Drawing instruments, equipment and materials such as Scale Ruler, setsquares T-squares, pencils, drawing paper etc. • Marker board • Drawing paper	4.1 Illustrate isometric and oblique projections 4.2 Draw a square in isometric and oblique forms 4.3 Draw a circle in isometric and oblique forms 4.4 Draw an ellipse in isometric and oblique forms 4.5 Draw a polygon with a minimum of eight sides in isometric and oblique forms. 4.6 Represent dimensional holes, circles, circs and angles correctly in isometric and oblique drawings 4.7 Use of appropriate conventional symbols and abbreviations	• Show the different methods of constructions of these figures	• Construction of isometric and oblique drawings with corresponding projections
GENERAL OBJECTIVE 5		Understand the Principles of orthographic projections				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
12 – 13	5.1 Explain the principles of orthographic projections 5.2 Explain why the first and third angles are used and the second and fourth angle are not used.	Explain the principles of orthographic projections And give reasons why the first and third angles are used and the second and fourth angle are not used.	• Drawing instruments, equipment and materials such as Scale Ruler, setsquares T-squares, pencils, drawing paper etc. • Marker board • Drawing paper	5.3 Illustrate the principle planes of projection: a) vertical plane b) horizontal plane 5.4 Show why the first and third angle are used and the second and fourth angle are not used. 5.5 Project views of three-dimensional objects on to the basic planes of projection in both first and third angle to obtain: a) the front view or elevation b) the top view or plan	• Show the different methods of constructions of these figures	• Construct orthographic projections of selected objects
GENERAL OBJECTIVE 6		Understand the Intersections of regular solids				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
14 – 15			• Drawing	6.1 Explain interpenetration or	• Show the different	• Draw regular solids

			instruments, equipment and materials such as Scale Ruler, setsquares T-squares, pencils, drawing paper etc. • Marker board • Drawing paper	intersections of solids 6.2 Draw the lines of intersections of the following regular solids and planes in both first and third angles: a) Two dissimilar square prisons meeting at right angles. b) Two dissimilar square prisons meeting at an angle. c) A hexagonal prison meeting square prison at right angles. d) Two dissimilar cylinders meeting at right angles. e) Two dissimilar cylinders meeting at an angle. f) Two dissimilar cylinders meeting at right angle, their centers not being in the same vertical plane g) A hexagonal prison meeting square prison at right angles. h) Two dissimilar cylinders meeting at right angles. i) Two dissimilar cylinders meeting at an angle. j) Two dissimilar cylinders meeting at right angle, their centers not being in the same vertical plane	methods of constructions of these figures	with intersections

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 122)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	0%
Test	At least 2 progress tests for feedback.	30%
Practical	At least 5 home works to be assessed by the teacher	70%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **BUILDING CONSTRUCTION II**

COURSE CODE: **ARC 123**

DURATION: **1– 2 – 3 – 3**

UNITS: **3 UNITS**

GOAL: The course is designed to acquaint students with skills and knowledge of construction of various building elements.

GENERAL OBJECTIVES: On completion of this course the diplomats should be able to:

1) Know the different types of floors
2) Understand masonry wall construction
3) Understand construction of Staircases
4) Know the types of roofs and ceiling structures and Coverings

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1– 2 – 3 – 3**
COURSE TITLE	**BUILDING CONSTRUCTION II**				**COURSE CODE**	**ARC 123**
GOAL	**ON COMPLETION OF THIS COURSE, THE STUDENT SHOULD KNOW THE CONSTRUCTION OF VARIOUS BUILDING ELEMENTS.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Know the different types of floors					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 4	1.1 Define floor, wall, stairs and staircases, roof and ceiling. 1.2 State the functions of 1.1. 1.3 Enumerate the various types of ground floors. 1.4 Draw the various types of floors. 1.5 Enumerate the various types of suspended floors. 1.6 State the methods of constructing suspended floor. 1.7 State the differences between ground floors and suspended floors.	1.8 Explain floor, wall, stairs and staircases, roof and ceiling. • Explain the function of floors • Explain the methods of constructing the various types of floors. • Explain with drawings the methods of constructing timber floors. • Explain the various types of suspended floors • Differentiate between ground floors and suspended floors	• Marker board, • PowerPoint and AV projection equipment.	1.1 Identify the types of ground floors 1.2 Select the materials use for these types of floors. 1.3 Illustrate the various types of ground and suspended floors 1.4 Draw the various types of floors 1.5 visit a site to view 1.1 to 1.4 above	• Guide students to draw different types of floor. • Guide students to construct a model floor. • Show students types of suspended floor Demonstrate with appropriate sketches • Make students to carry out good sketches based of SLO 1.1 to 1.4. .	• List the various types of ground floors. • Produce sketches of various floor types • Enumerate materials for various types of floors.
GENERAL OBJECTIVE 2	Understand masonry wall construction					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
5 – 8	2.1 State the functions of walls. 2.2 List the various types of walls in use e.g. load bearing, non-load bearing etc.. 2.3 Define partition walling 2.4 State the functions of partition walls	• Explain with drawings the methods of constructing these various types of walls. • Explain the various types of walls in use e.g load bearing and non-load bearing • Differentiate between load and non-load bearing walls • List the materials used in wall construction.. • List the various types of partition walls.	• Marker board, • PowerPoint and AV projection equipment. • Drawing instruments • Drawing Studio	2.1 Draw a typical timber partition wall using timber frame. 2.2 Illustrate with drawings the various block wall constructions. 2.3 Illustrate with sketches how partition walls are constructed 2.4 Use question and answer to discuss walls.	• Guide students to identify various types of materials used in wall construction • Guide students to sketch types of walls in construction • Organize visit to a new construction site for the students to appreciate the various types of wall construction	• Make sketches of various types of walls • List the materials used in wall construction. • Produce sketch of typical timber partition wall • Explain the merits and demerits of the various types of partition walls.

GENERAL OBJECTIVE 3		Understand construction of Staircases				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9 – 11	3.1 Define stair and staircase 3.2 List the various types of staircases 3.3 Define the terminologies used in staircase construction 3.4 Derive risers; tread sizes, width of flight, width of mid-landing, etc. for the various types of staircases listed above.	• Explain stair and staircase • Engage students in a discussion to explain the terminologies used in staircase construction • Explain the various types of staircases in a given plan as a case study.	• Marker board, • PowerPoint and AV projection equipment. • Drawing board, • Drawing instruments	3.1 Illustrate the terminologies used in staircase construction 3.2 Draw the various types of staircases in plan, elevations and sections 3.3 Demonstrate with the aid of sketches and according to building regulation requirements, the method of constructing various types of staircases in timber, steel and reinforced concrete. 3.4 Illustrate the various types of staircases 3.5 Draw the various types of staircases in plan, 3.5 Derive risers, tread sizes, width of flight, width of mid-landing, etc. for the various types of staircase listed in 3.2	• Guide the students to draw staircases in plans, elevations, and sections. • Guide students to construct staircase models • Show the various types of staircases in plan, elevations and sections	• Describe staircase • Draw the various types of staircases in plan, elevations and sections
GENERAL OBJECTIVE 4		Know the types of roofs and ceiling structures and Coverings				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
12-15	4.1 Identify types of roof coverings and ceilings 4.2 Describe how 1.1 is fixed. 4.3 Enumerate fixing methods 4.4 State the properties and fixing details of various roof covering. 4.5 Describe with drawings the water proofing systems of the various types of roofs 4.6 Enumerate the various types of ceilings. 4.7 State the functions of the listed types of ceilings.	• Explain types of roof covering and ceilings and their fixing methods • State the properties and fixing details of various roof covering • List the functions of various types of ceilibgs • Describe with drawings the water proofing systems of the various types of roofs.	• Marker board, • PowerPoint and AV projection equipment. • Drawing board, • Drawing instruments	4.1 Illustrate various methods of construction of various roof structures in timber, concrete and steel. 4.2 Illustrate drainage systems of the various types of roofs. 4.3 Illustrate the methods of construction of various roof structures in timber, concrete and steel. 4.4 Illustrate the drainage systems of the various types of roofs.	• Guide students to Practice various methods of construction of various types of ceiling • Guide students to identify the waterproofing Systems of the various types of roof.	• .Name the types of roof coverings and ceilings and their fixing methods • Explain water proofing systems of roofs. • What are the functions of a ceiling

		• Explain the methods of constructing ceilings				

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 123)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **ARCHITECTURAL GRAPHICS 1**

COURSE CODE: **ARC 124**

DURATION: **0 –3– 3 – 3**

UNITS: **3 UNITS**

GOAL: This course is designed to acquaint students with knowledge and skills of Architectural Graphics.

GENERAL OBJECTIVES: On completion of this module the trainee will be able to:

1) Understand the principles of perspective drawing.
2) Know how to code, trace and reproduce drawings.
3) Undertake drafting of various drawings accurately.
4) Understand the Principles of shade and shadow.
5) Differentiate shade from shadow.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**0 –3 – 3 – 3**
COURSE TITLE	**ARCHITECTURAL GRAPHICS 1**				**COURSE CODE**	**ARC 124**
GOAL	**THIS COURSE IS DESIGNED TO PROVIDE THE STUDENT WITH AN IN-DEPTH KNOWLEDGE AND SKILLS OF ARCHITECTURAL GRAPHICS**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Understand the principles of perspective drawing					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 8			• Marker board • PowerPoint • Presentation • AV projection equipment • Exemplars • Drawing board • T-Square • Set-Square • Scale rule • Pencil • Various paper sizes and types etc.	1.1 Perform the basic theory of perspective drawing 1.2 Illustrate how to draw the perspective of a simple rectangular object 1.3 Illustrate vanishing point and its effect on perspective drawing 1.4 Construct ground line, eye level and true height line in perspective 1.5 Illustrate the types of and the variables in perspective drawings 1.6 Apply the variables in perspective drawing 1.7 Draw simple objects involving straight and curved lines in 1-point, 2-point and 3-point perspective drawings 1.8 Explain vanishing point (VP) and observation point and its effect on the three basic lines of perspective drawing 1.9 Illustrate the following: - object plan - picture plain - station point - vanishing point - eye level 1.10 Differentiate the relationship between the following:	• Explain the theory of perspective drawing • Define picture plane, and its importance to perspective • Differentiate the relationship between the following: - object plan - picture plain - station point - vanishing point - eye level • Guide student to construct ground line, eye level and true height line in perspective • Show students vanishing point (VP) and observation point and its effect on the three basic lines of perspective drawing • Guide students to identify one point, two point and 3-point perspectives using the various variables • From above guide students to produce a one-point perspective drawing of shaped rectangular prism • Guide student to	• Produce sample drawings and keep portfolio. • Discuss theory of perspective drawing • Produce sample drawings for assessment • Discuss the following: - object plan - picture plain - station point - vanishing point - eye level • Construct ground line, eye level and true height line in perspective • Draw perspectives with vanishing point • Produce sample drawings • Produce 3-point perspectives using various variables • Produce 1-point perspectives using various variables • Produce straight and curved lines in 1-point, 2-point and 3-point perspective drawings

				- object plan - picture plain - station point - vanishing point - eye level	produce straight and curved lines in 1-point, 2-point and 3-point perspective drawings	
GENERAL OBJECTIVE 2		Know how to code, trace and reproduce drawings				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9			• Marker board • PowerPoint Presentation and AV projection equipment. • Drawing pens of various point sizes • Tracing paper • Drawing board • T-square, etc. • Exemplars	2.1 Illustrate how to reproduce, trace and present drawings 2.2 Produce simple drawings to demonstrate how to trace drawings. 2.3 Illustrate layout drawings, title blocks, coding of drawing sheets.	• Guide students how to reproduce, trace and present drawings • Guide student to produce simple drawings to demonstrate how to trace drawings. • Guide student to complete remaining trace work in studio or drawing room and keep portfolio.	• Reproduce, trace and present drawings • Produce layout drawings
GENERAL OBJECTIVE 3		Undertake drafting of various drawings accurately				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
10 – 12			• Drawing pens of various point sizes, cardboard sheets, scale rules, tracing paper, drawing board, T-square in a drawing room of design studio	3.1 Choose the appropriate grade of pencil for drafting. 3.2 Choose the appropriate scales for drawing. 3.3 Illustrate how to undertake various drawings 3.4 Project the elevations And section 3.5 Draft doors and windows schedule, finishing drawings, sanitary drawings, site plan, etc. 3.6 Produce drawings in ink 3.7 Stencil Traced Drawings in ink 3.8 Annotat Traced Drawings in ink 3.9 Code the finished drawings in the conventional order	• Guide student to choose the appropriate grade of pencil for drafting. • Guide student to choose the appropriate scales for drawing. • Guide student to Draft the plan of a given building design using a given set of drawings as a guide. • Guide student to project the elevations And sections • Guide student to draft the doors and windows schedule,	• Demonstrate appropriate grade of pencil for drafting. • Draft the plan of a given building design • Project the elevations And section • Draft doors and windows schedule, finishing drawings, sanitary drawings, site plan, etc s • Trace drawings in ink using various pen sizes • Stencil and annotate the traced drawings

					finishing drawings, sanitary drawings, site plan, etc. • Guide student to trace in ink the drawings drafted in above. • Guide student to Stencil the traced drawings and annotate same • -Code the finished drawings in the conventional order.	
GENERAL OBJECTIVE 4		Understand the Principles of shade and shadow				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
13 – 15			• Marker board • PowerPoint presentation and AV projection equipment	4.1 Differentiate shade and shadow in shadow casting 4.2 Demonstrate the principle of light transmittance to shade and shadow effect 4.3 Illustrate various methods of casting shadow and depicting shades 4.4 Illustrate shade and shadow of points, lines, planes and solids. 4.5 Apply shades and shadows to building plans and elevations	• Show students how to identify sources of light, illustrating the physics and principle of light transmittance on solid objects • Explain the principle of light transmittance to shade and shadow effects • Guide student to Illustrate the various methods of casting shadow and depicting shades • Guide student to illustrate the shade and shadow of points, lines, planes and solids. • Guide student to illustrate the shade and shadow of points, surfaces and recesses, of reflecting	• List the sources of light, illustrating the physics and principle of light transmittance on solid objects • Explain the principle of light transmittance to shade and shadow effects • Explain various methods of casting shadow and depicting shades • Explain the shade and shadow of points, lines, planes and solids. • Illustrate the shade and shadow of points surfaces and recesses, of reflecting and non-reflecting surfaces. • Project shades and shadows to building plans and elevations.

					and non-reflecting surfaces. • Guide student to apply shades and shadows to building plans and elevations. • Guide students how to select various rendering techniques (pencil, pen, colour, lettersets, templates, etc.) in shading and shadow casting. • Keep portfolio.	• Describe the various rendering techniques (pencil, pen, colour, lettersets, templates, etc.) in shading and shadow casting.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 124)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	0%
Test	At least 2 progress tests for feedback.	30%
Practical	At least 5 home works to be assessed by the teacher	70%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **PROPERTIES OF MATERIALS**

COURSE CODE: **ARC 125**

DURATION: **2– 0– 2 – 2**

UNITS: **2 UNITS**

GOAL: This course is designed to provide students with the basic knowledge of building materials commonly use.

GENERAL OBJECTIVES: On completion of this module the trainee will be able to:

1) Know how the properties of materials affect their choice for use.
2) Understand the physical and chemical properties of stone.
3) Know the properties of cement, its various types and factors affecting their choice for use.
4) Understand the physical and chemical properties of sand.
5) Understand the physical and chemical properties of water.
6) Understand the composition of plasters and mortars.
7) Understand the composition and the use of concrete in building construction.
8) Know the various clay products, their properties and how they are used.
9) Know the right types of wood that should be used for various types of construction works.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**2 – 0 – 2 – 2**
COURSE TITLE	**PROPERTIES OF MATERIALS**				**COURSE CODE**	**ARC 125**
GOAL	**THIS COURSE IS INTENDED TO PROVIDE THE STUDENT WITH THE BASIC KNOWLEDGE OF BUILDING MATERIALS IN COMMON USE.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Know how the properties of materials affect their choice for use.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 5	1.1 Define building materials with reference to their classifications. 1.2 List the structure of materials with respect to their atomic structure, quantum number, electronic configuration, etc. 1.3 List the structure of materials with respect to their atomic structure, quantum number, electronic configuration, etc. 1.4 Define the types of atomic and molecular bonding that exist in solids and liquids. 1.5 Illustrate the crystalline state of materials. 1.6 Explain the different types of imperfection in crystals. 1.7 Describe the mechanical behaviours of the materials mentioned above. 1.8 Explain the basic principles of hardness and impact testing. 1.9 Explain the theory of plastic deformation 1.10 Describe the deformation process of solids. 1.11 Explain fracture mechanism in solids 1.12 Describe a physical basis for conductors, semi-conductors and insulators. 1.13 Classify materials in	• Define the term building materials. • Identify building materials with reference to their classifications. • Explain the structure of materials with respect to their atomic structure, quantum number, electronic configuration, etc. • Explain the structure of materials with respect to their atomic structure, quantum number, electronic configuration, etc. • Explain the types of atomic and molecular bonding that exist in solids and liquids. • Lectures with illustrations and assignments.	• Marker board • Audio Visual Equipment • Slide projector • Overhead projectors • Transparencies. • Instructional materials • Charts • Projectiles • Models			• Define building materials with reference to their classifications. • List the structure of materials with respect to their atomic structure, quantum number, electronic configuration, etc. • Describe a physical basis for conductors, semi-conductors and insulators. • Explain the theory of conduction as applicable to materials. • Describe the deformation process of solids. • Explain fracture mechanism in solids • Describe a physical basis for conductors, semi-conductors and insulators

	relation to their electrical resistivity magnitude. 1.14 Explain the theory of conduction as applicable to materials. 1.15 Describe the dialectic behaviour in materials. 1.16 Explain the magnetic phenomena in materials. 1.17 Enumerate the general requirements for materials selection, e.g., mechanical, physical and chemical properties, durability, availability, cost, function, aesthetic, etc.					
GENERAL OBJECTIVE 2		Understand the physical and chemical properties of stone.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
6	2.1 Identify the various types of stones and their sources. 2.2 Determine the uses of stones in buildings. 2.3 Explain the porosity, absorption, and void space property of stone. 2.4 Illustrate the methods of performing tests for cleanliness.	• Explain 2.1 to 2.4 with relevant examples and illustrations	• Marker board • Audio Visual Equipment • Slide projector • Overhead projectors • Transparencies.			• Enumerate the various types of stones and their sources. • Enumerate the uses of stones in buildings. • Explain the porosity, absorption, and void space property of stone. • Illustrate the methods of performing tests for cleanliness.
GENERAL OBJECTIVE 3		Know the properties of cement, its various types and factors affecting their choice for use.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
7	3.1 Specify the different types of cement and their uses. 3.2 Explain standard tests on cement for strength.	• Explain 3.1 to 3.2 with relevant examples and illustrations	• Marker board • Audio Visual Equipment • Slide projector • Overhead projectors • Transparencies.			• List the different types of cement and their uses. • Explain standard tests on cement for strength.

GENERAL OBJECTIVE 4		Understand the physical and chemical properties of sand.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
8	4.1 List out the different types of sand and their sources, e.g., sea sand from sea, river sand from the river, pit sand from the pit, quarry dust from the quarry. 4.2 State the qualities of sand and their uses. 4.3 State the methods for removing impurities from sand.	• Explain 4.1 to 4.3 with relevant examples and illustrations	• Marker board • Audio Visual Equipment • Slide projector • Overhead projectors • Transparencies.			• Enumerate the different types of sand and their sources • State the qualities of sand and their uses. • State the methods for removing impurities from sand.
GENERAL OBJECTIVE 5		Understand the physical and chemical properties of water.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9	5.1 Enumerate the various sources of water. 5.2 State the qualities of water required for construction.	• Explain 5.1 to 5.2 with relevant examples and illustrations	• Marker board • Audio Visual Equipment • Slide projector • Overhead projectors • Transparencies.			• State the qualities of water required for construction.
GENERAL OBJECTIVE 6		Understand the composition of plasters and mortars.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
10	6.1 Describe the composition of lime mortar and its uses. 6.2 State different types and methods of plastering using mechanical means where appropriate, e.g., Tyrolene. 6.3 State the different types of sandcrete and their uses.	• Explain how to apply lime mortar for internal and external walls and to specification. • Explain the composition of cement plasters, the ratio and proportion of mix and the specification.	• Marker board • Audio Visual Equipment • Slide projector • Overhead projectors • Transparencies.			• Describe the composition of lime mortar and its uses. • State different types and methods of plastering using mechanical means where appropriate
GENERAL OBJECTIVE 7		Understand the composition and the use of concrete in building construction.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
11	7.1 State the components of concrete 7.2 Enumerate the function of each of the components in 7.1 above. 7.3 State the various types of aggregate and their sizes.	• Explain with illustrations the various mixes of concrete and their applications. • Explain the standard	• Marker board • Audio Visual Equipment • Slide projector • Overhead projectors • Transparencies.	7.1	•	• State the components of concrete • State the various types of aggregate and their sizes. • Differentiate

	7.4 Differentiate between mixture by volume and mixture by weight.	tests on concrete for setting time, workability, water cement ratio, and expansion.				between mixture by volume and mixture by weight.
GENERAL OBJECTIVE 8		Know the various clay products, their properties and how they are used.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
12 – 13	8.1 State the different types of clay. 8.2 State the properties of clay products, i.e. porosity, absorption, efflorescence, strength, density, moisture content, thermal movement, and durability. 8.3 Describe the manufacture of brick, brick tiles, brick blocks and clay products. 8.4 State the various ways of using clay for building works.	• Explain the different types of clay. • Discuss the properties of clay products, i.e. porosity, absorption, efflorescence, strength, density, moisture content, thermal movement, and durability. • Describe the manufacture of brick, brick tiles, brick blocks and clay products. • Explain the various ways of using clay for building works.	• Marker board • Audio Visual Equipment • Slide projector • Overhead projectors • Transparencies.	8.1	•	• State the different types of clay. • State the properties of clay • State the various ways of using clay for building works.
GENERAL OBJECTIVE 9		Know the right types of wood that should be used for various types of construction works.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
14 – 15	9.1 List the processes of wood growth with illustrations of their structures. 9.2 Narrate the processes involved in the preparation of timber for use. 9.3 Describe the various defects in timber, their causes and consequent effects on construction process. 9.4 Classify timber as hard wood and softwood stating the distinguishing characteristics.	• Explain the processes of wood growth with illustrations of their structures. • Illustrate the various defects in timber, their causes and consequent effects on construction process. • Classify timber as hard wood and softwood stating the distinguishing characteristics. • State the various types	• Marker board • Audio Visual Equipment • Slide projector • Overhead projectors • Transparencies.	8.1	•	• List the processes of wood growth with illustrations of their structures. • Describe the various defects in timber, their causes and consequent effects on construction process. • Classify timber as hard wood and softwood stating the distinguishing characteristics. • Describe the various

	9.5 State the various types of West African timbers in use. 9.6 Describe the various methods of timber conversion stating their relative merits. 9.7 Identify the various causes of deterioration in converted timber, stating necessary precautions to be taken to avoid them.	of West African timbers in use. • Explain the purpose of seasoning timber, describing the various methods. • Explain the B.S. system of grading timber.				methods of timber conversion stating their relative merits. • Identify the various causes of deterioration in converted timber, stating necessary precautions to be taken to avoid them.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 125)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	70%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	10%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **INTRODUCTION TO COMPUTER AIDED DESIGN AND DRAFTING**

COURSE CODE: **ARC 126**

DURATION: **0 – 3 – 3 – 3**

UNITS: **3 UNITS**

GOAL: This course is designed to provide students with the basic principles of drawing using Computer Aided Design (CAD).

GENERAL OBJECTIVES: On completion of this module the student will be able to:

1) Deduce working knowledge and skills about drawing concepts and techniques using CAD.
2) Know the methods of pattern development for simple geometrical shapes.
3) Deduce the intersection lines for intersected cylinders.
4) Interpret the technical drawings in a specialist field.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**0 – 3 – 3 – 3**
COURSE TITLE	**INTRODUCTION TO COMPUTER AIDED DESIGN AND DRAFTING**				**COURSE CODE**	**ARC 126**
GOAL	**THIS COURSE IS DESIGNED TO DEVELOP AN UNDERSTANDING OF THE BASIC PRINCIPLES OF DRAWING USING COMPUTER AIDED DESIGN (CAD).**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Gain working knowledge and skills about drawing concepts and techniques using CAD.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 5			• PC linked to interactive Whiteboard • Computer Laboratory • Relevant CAD software • Text books • Printer/ Plotter	1.1 Identify program commands and files. 1.2 Use program commands and files. 1.3 Use the Menu and Tool bars 1.4 Draw two dimensional (2D) technical drawings. 1.5 Annotate technical drawings 1.6 Apply basic CAD skills in a specialist field	• Guide students to identify program commands, files, Menu and Tool bars • Guide student through the following: - Standard Windows Toolbars - Pull down menus, file, edit, view, insert, format, tools, draw, dimensions, modify - Layer toolbar - Shortcut commands(X and Y) on screen & co-ordinates - Model and paper space - Scale 1:1 and printing scales - Command prompts box • Accessing current CAD program • Bottom tabs & set-up for drawing: snap, grid, ortho, osnap, otrack • Drawing lines basics • Control of mouse • Provide simple	• Draw and modify two dimensional (2D) technical drawings. • Annotate simple technical drawings

					practical exercise(s) • Introduce layering as required. • Demonstrate how to annotate • Dimensions Text/ information • Provide simple practical exercise(s) • Guide student to show dimensions and text on 2D drawings. • Guide student to name, save appropriately.	
GENERAL OBJECTIVE 2		Know the methods of pattern development for simple geometrical shapes.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
6 – 7			• PC linked to interactive Whiteboard • Computer Laboratory • Relevant CAD software • Text books • Printer/ Plotter	2.1 Illustrate the principles and methods of surface development. 2.2 Develop simple 3D geometric shapes i.e. cylinders, cubes, cones and pyramids.	• Explain the principles and methods of surface development. • Demonstrate how to create simple 3D geometric shapes i.e. cylinders, cones and pyramids. • Provide simple practical exercise(s) • Demonstrate how to create simple 3D forms within a specialist field – architecture, interior design, construction etc. • Provide simple practical exercise(s) • Guide student to name, save appropriately.	• Develop simple 3D geometric shapes i.e. cylinders, cubes, cones and pyramids.

GENERAL OBJECTIVE 3		Deduce the intersection lines for intersected cylinders.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
8 – 9			• PC linked to interactive Whiteboard • Computer Laboratory • Relevant CAD software • Text books • Printer/ Plotter	3.1 Draw the intersection line of all cases of intersected cylinders (equal right cylinders, unequal right cylinders, equal other than 90 cylinders and unequal other than 90 cylinders).	• Guide students how to draw the intersection line of all cases of intersected cylinders (equal right cylinders, unequal right cylinders, equal other than 90 cylinders and unequal other than 90 cylinders). • Provide simple practical exercise(s) • Guide student to draw the intersection line of all cases of intersected cylinders	• Draw the intersection line of all cases of intersected cylinders
GENERAL OBJECTIVE 4		Interpret and deduce the technical drawings in a specialist field.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
10 – 15			• PC linked to interactive Whiteboard • Computer Laboratory • Relevant CAD software • Text books • Printer/ Plotter	4.1 Identify the main features of the six views of an object. 4.2 Draw the three views of an object in first and third angle projections. 4.3 Identify the inter-relation between the three views of an object. 4.4 Deduce the third missing view from given two views of an object. 4.5 Demonstrate the inter-relation between the three views of an object. 4.6 Provide a practical exercise within a specialist field. 4.7 Illustrate the main features of the six views of an object or space within a	• Guide student to draw the three views of an object/ space in first and third angle projections. • Guide students to deduce the Third missing view from given two views of an object. • Guide student through printing/plotting procedure. • Guide students to identify main features of the six views of an objector space within a specialist field	• Draw the three views of an object in first and third angle projections. • Deduce the third missing view from given two views of an object.

				specialist field.		

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 126)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	0%
Test	At least 2 progress tests for feedback.	40%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **HISTORY OF ARCHITECTURE**

COURSE CODE: **ARC 127**

DURATION: **2– 0– 2 – 2**

UNITS: **2 UNITS**

GOAL: This course is designed to create awareness of past architectural development in students.

GENERAL OBJECTIVES: On completion of this module the students will be able to:

1) Appreciate the history of the development of architecture of different civilizations.
2) Understand the use of materials and evolution of forms for different periods.
3) Outline influences in the development of architecture and design.
4) Evaluate a specific area of architecture and design.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**2 – 0– 2 – 2**
COURSE TITLE	**HISTORY OF ARCHITECTURE**				**COURSE CODE**	**ARC 127**
GOAL	**THIS COURSE IS INTENDED TO CREATE AWARENESS OF PAST ARCHITECTURAL DEVELOPMENT IN THE STUDENT**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Understand the history of the development of architecture of different civilizations.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 - 5	1.1 Define Architecture. 1.2 Trace the antecedents. 1.3 Explain the evolution of various forms in Architecture 1.4 Name the factors that have affected the evolution of their forms. 1.5 State the geographical, geological, climatic, social, religious, and cultural influences on the Architectural forms of these various periods.	• Explain architecture as having an origin that is as old as human history. • Explain the architecture of the various periods, namely: - -Egyptian Architecture - -Greek Architecture - -Roman Architecture - -Gothic Architecture - Christian Architecture - Islamic Architecture • Explain the various aspects of forms development • Explain the factors that have affected the evolution of their • Explain geographical, social, climatic, religious, and cultural determinants of architectural forms.	• Marker board • Audio Visual Equipment • Slide projector • Overhead projector • Transparencies.			• Identify Architecture of various period • List five factors that have affected the evolution various forms of architecture. • Produce study sheets showing architecture of the various periods. • Describe how Climate, Society, Culture and religion influence Architectural forms of various periods
GENERAL OBJECTIVE 2	Understand the use of materials and evolution of forms for different periods.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
6 – 7	2.1 Explain the dominant features of building structures taking into	• Discuss features of the architecture periods • Illustrate how	• Marker board • Audio Visual Equipment			• Differentiate the features and arrangement of

	consideration the scale and proportion, arrangements, and structural components of the different periods.	materials and structural forces have determined the various forms.	• Slide projector • Overhead projector • Transparencies.			structural components of the Egyptian, Greek, Roman and Gothic Architecture using sketches
GENERAL OBJECTIVE 3		Outline influences in the development of architecture and design.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
8 – 12	3.1 Describe influences in the development of architecture and design.	• Describe the Influence and Development of Architecture and Design Worldwide – e.g. De-constructivism • Outline a topic and set a question for discussion. • Facilitate student discussion and/ or debate	• Marker board • Audio Visual Equipment • Slide projector • Overhead projector • Transparencies.			• Explain how climate and culture influences architectural forms
GENERAL OBJECTIVE 4		Evaluate a specific area of architecture and design.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
13 – 15	4.1 Evaluate, contextualize and reference areas/periods of architectural development. 4.2 Carry out research on a period of architecture 4.3 Present a report on a given style of architecture	• Describe how to evaluate, contextualize and reference areas/periods of architectural development. • Guide student to discuss areas of interest based on the previous lectures.	• Marker board • Audio Visual Equipment • Slide projector • Overhead projector • Transparencies. • Text books			• Present a report on a given style of architecture • Use Qualitative research method to prepare a design of a self-selected area of interest.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 127)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **WORKSHOP PRACTICE II**

COURSE CODE: **BLD 106**

DURATION: **0– 4– 4 – 4**

UNITS: **4 UNITS**

GOAL: This course is designed to acquaint students with the basic skills in woodworking craft and the application of wood joints in various wooden components.

GENERAL OBJECTIVES: On completion of this module the trainee will be able to:

1) Know Woodworking tools and Equipment.
2) Understand Factory Acts and Safety Regulations applicable in the Wood workshop.
3) Know the types of Timber used for various work Purposes.
4) Know the various types of wood joints.
5) Know the different types of jointing materials.
6) Use the various woodworking machines.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**0 – 4 – 4 – 4**
COURSE TITLE	**WORKSHOP PRACTICE II**				**COURSE CODE**	**BLD 106**
GOAL	**THIS COURSE IS DESIGNED TO EQUIP THE STUDENT WITH THE BASIC SKILLS IN WOODWORKING CRAFT AND THE APPLICATION OF WOOD JOINTS IN VARIOUS WOODEN COMPONENTS.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Know Woodworking tools and Equipment.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 3			• Workshop cramps, shooting boards, benches, marking gauges tapes, pencil, caliper& wing compasses, Tee Square, sliding level. • Saws, chisels and planes, hammer, mallets nail punches, screw drivers, ratchet brace.	1.1 Use woodworking tools and equipment such as the following: - Cramps - Shooting boards - Benches 1.2 Use geometrical tools such as marking gauges tapes, pencil, caliper and wing compasses, T-square and sliding level. 1.3 Demonstrate how to use cutting tools such as saws chisels and planes 1.4 Differentiate between fixing tools such as Hammer, Mallets, Nail punches, Screwdrivers and the Ratchet Brace. 1.5 Illustrate the differences between fixing tools such as Hammer, Mallets, Nail punches, Screw drivers and the Ratchet Brace.	• Guide student to use the cramps, shooting boards and benches • Guide student to use geometrical tools such as marking gauges tapes, pencil, caliper and wing compasses, T-square and sliding level. • Guide student to use cutting tools such as saws chisels and planes • Guide student how to differences between fixing tools such as Hammer, Mallets, Nail punches, Screw drivers and the Ratchet Brace.	• Mention some geometrical tools you know. • Explain the use of the following: - Cramps - Shooting boards - Benches - Marking gauges - Tapes - Pencil, caliper and wing compasses, T-square and sliding level, etc
GENERAL OBJECTIVE 2	Understand Factory Acts and Safety Regulations applicable in the Wood workshop.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
4 – 6			• Marker board • Factory acts safety regulations. • First aid equipment	2.1 Appreciate adequate ventilation for the workshop. 2.2 Illustrate the layout of an ideal wood-workshop 2.3 Demonstrate the importance of storage facility for tools and first aid equipment.	• Guide student how to layout an ideal wood workshop • Show how to create and store first aid equipment, storage facility for tools • Guide student how to observe factory acts	• Explain the importance of first aid equipment • Demonstrate general safety habits in a workshop

				2.4 Illustrate factory acts 2.5 Demonstrate general safety habits with respect to both mechanical and electrical machinery		

GENERAL OBJECTIVE 3		Know the types of Timber used for various work Purposes.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
7 – 8			• Equipped Workshop • Workshop Consumables	3.1 Select various types of timber used in construction work purposes. 3.2 Illustrate suitable timber conversion methods such as slab saw, tangential sawing and quarter sawing. 3.3 Identify various sizes of available timber available in the market. 3.4 Illustrate the growth, structure and shrinkage of timber	• Guide student to Differentiate hardwood from softwood and their respective formation processes. • Guide student to discuss - Preservation methods with practical examples. - diffusion process • various sizes of available timber • Show student various seasoning methods of Timber such as: - natural/air seasoning - kiln seasoning - compartment kilns - progressive kilns - combined air and kilns method - chemical seasoning	• Differentiate hardwood from softwood. • Show samples of hard wood and softwood • Describe their respective formation processes. • Explain seasoning methods of Timber
GENERAL OBJECTIVE 4		Know the various types of wood joints.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9 – 11			• Equipped Workshop • Workshop Consumables	4.1 Identify the use of various types of joints. 4.2 Demonstrate the use of various types of joints. 4.3 Construct angle joints such as dovetail joint, housing joint and dowel joint. 4.4 Construct widening joints	• Guide student how to identify various types of joints • Guide student to construct widening joints and tongue and groove joints. • Guide student to	• Demonstrate how to construct the various joints • Construct widening joints and tongue and groove joints. • Construct angle joints such as

				and tongue and groove joints. 4.5 Illustrate various types of wood joint	construct the following joints: a. Frame joint. b. Tee and cross halving joint. c. Common mortise and Tenon d. Hunched Tenon joint. e. Long and short shouldered mortise and Tenon with rebate. • Construct angle joints such as dovetail joint, housing joint and dowel joint.	dovetail joint, housing joint and dowel joint.
GENERAL OBJECTIVE 5		Know the different types of jointing materials.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
12 – 13			• Workshop and consumables (nails, screws of various types, bolts and nuts, timber connectors etc. • Wood adhesives such as thermo-setting and thermoplastic, resins.	5.1 Use the various jointing materials. 5.2 Classify wood adhesives, e.g. Thermo-setting and Thermoplastic 5.3 Demonstrate use of bolts and nuts, timber connectors. 5.4 Identify wood adhesives.	• Guide student to perform the following: - Use nails of different sizes on given job types. - Use various types of screws such as raised head, round head, countersunk head and coach or square head on given job types. - Use other materials such as bolts and nuts, timber connectors etc. • Guide student to Differentiate between properties of animal and synthetic resin adhesives and their advantages i.e. Epoxy	• Construct simple joint using nails, screws, bolts etc. • Differentiate properties of animal and synthetic resin adhesives and their advantages • Demonstrate use of bolts and nuts, timber connectors.

					resin, polyvinyl acetate (P.V.A) and rubber based adhesives: their advantages and Applications.	
GENERAL OBJECTIVE 6		Know the various woodworking machines in use.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
14 – 15			• Workshop with: - Planning Machine - Sawing Machine - Band saw machine - Spindle moulding machine - Drilling machine - Mortise machine - Tenon machine - Sanding and portable hand machines	6.1 Classify woodworking machines e.g. a) Planing machine b) Sawing machine c) Band saw machine d) Spindle moulding machine e) Drilling machine f) Mortise and Tenon machine g) Sanding and portable hand machines 6.2 Demonstrate use of the listed machines 6.3 Demonstrate the maintenance procedure for the listed .	• Guide student how to classify woodworking machines e.g. h) Planing machine i) Sawing machine j) Band saw machine k) Spindle moulding machine l) Drilling machine m) Mortise and Tenon machine n) Sanding and portable hand machines. • Guide student to Identify and maintenance procedure for the listed machine.	• Identify various woodworking machines. • Demonstrate the maintenance of the machines

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (BLD 106)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	0%
Test	At least 2 progress tests for feedback.	30%
Practical	At least 5 home works to be assessed by the teacher	70%
TOTAL WEIGHT		**100**

ARCHITECTURAL TECHNOLOGY

ND II

FIRST SEMESTER COURSES

PROGRAMME:	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**
COURSE TITLE:	**ARCHITECTURAL DESIGN II**
COURSE CODE:	**ARC 211**
DURATION:	**1 – 3 – 4 – 4**
UNITS:	**4 UNITS**
GOAL:	This course is designed to acquaint students with the basic tenets to produce a simple architectural design.
GENERAL OBJECTIVES:	On completion of this module the student will be able to:

1) Analyze human activities and circulation for a simple design.
2) Understand the hierarchy of the various spaces in the building types.
3) Know how to design structure.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 3 – 4 – 4**
COURSE TITLE	**ARCHITECTURAL DESIGN II**				**COURSE CODE**	**ARC 211**
GOAL	**THIS COURSE IS DESIGNED TO EQUIP THE STUDENT WITH BASIC TENETS TO PRODUCE A SIMPLE ARCHITECTURAL DESIGN.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Analyze human activities and circulation for a simple design.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 3	1.1 Explain design brief is 1.2 List the elements in architectural design 1.3 Describe the development of current design concepts employed in sketch design	• What ia a design brief • Explain the purpose of a design brief. • Discuss the development of design process	• Marker board • PowerPoint presentation and AV Projection equipment. • Exemplars • Relevant textbooks	1.1 Produce a design brief of different building types. 1.2 Produce design schemes of different building types. 1.3 Differentiate the relationship between the different functions in a design. 1.4 Draw a bubble diagram showing the inter-relationship of the different spaces in these building. 1.5 Illustrate the sequence of events in the building.	• Guide student to identify the function that take place in simple building types as: snack bar, 2 bedroom bungalow, kiosk, bus-stop shelter etc. • Show the relationship between the different function in the simple building above. • Guide student to draw a bubble diagram showing the inter-relationship of the different spaces in these building. • Guide student to draw a bubble diagram showing the inter-relationship of the different spaces in these building.	• Explain the purpose of a design brief. • Draw a bubble diagram showing the inter-relationship of the different spaces in these building.
GENERAL OBJECTIVE 2	Understand the hierarchy of the various spaces in the building types.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
4 – 8	2.1 Describe the development of current design concepts employed in sketch design 2.2 Relate the development of design brief to the initial sketch scheme 2.3 Justify the development of the initial sketch scheme	• Discuss the development of design process. • Discuss the development of initial sketch scheme • Explain the development of initial sketch scheme	• Marker board • PowerPoint presentation and AV Projection equipment. • Exemplars • Relevant textbooks	2.1 Illustrate the hierarchical order of simple building types. 2.2 Illustrate the development of initial sketch scheme 2.3 Show the hierarchical order of simple building types. 2.4 Reproduce simple building types.	• Guide student to know the hierarchical order of the various building types using Private/Public Noisy/Quiet • Guide student to identify factors in the determination of	• Articulate the hierarchical order in terms of space sizes in a simple 2-Bedroom bungalow design. • Use sketches to give examples of 3 public building types in

					their sizes and factors which need to be considered at the initial stage. E.g. Government policies, physical constraints.	hierarchical order Noisy/Quiet • Shade, on a 2-Bedroom Bungalow floor plan, the various spaces in hierarchical order of Public/Private spaces. • Using sketch design, organize the various spaces in a simple 2-Bedroom design into hierarchical order of Public and Private zones
GENERAL OBJECTIVE 3		Know how to design structure.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9 – 15			• Marker board • PowerPoint presentation and AV Projection equipment. • Exemplars • Relevant textbooks	3.1 Develop sketch scheme 3.2 Illustrate the procedure of designing simple structures. 3.3 Prepare visual/ client presentation	Guide the students to • Develop a design brief of a simple building type. • Develop a hierarchical structure of the building. • Produce the space requirement • Produce a bubble diagram of the building. • Produce full presentation drawings • Produce working drawings • Produce construction details • Produce architectural models With the aid of sketches. • Facilitate project	• Design a simple 2-Bedroom Bungalow with Floor Plan, Sections, Elevations, Roof Plan and Site Plan • Develop working drawings and draw the details of the Roof Trusses of a simple 2-Bedroom Bungalow • Using design procedures taught, design a complete gate house. • Construct a scaled architectural model of a simple 2-Bedroom Bungalow. Create Portfolio for the drawings. • Present project

					development towards completion. • Illustrate presentation techniques and layout. • Assist in the production of a sample board. • Guide student to project conclusion as necessary with the individual student – technical drawing, perspectives, etc.	(drawings & Models) to a jury.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 211)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **PHOTOGRAPHY AND MODEL-MAKING MODEL MAKING**

COURSE CODE: **ARC 212**

DURATION: **0 – 2 – 2 – 2**

UNITS: **2 UNITS**

GOAL: This course is designed to acquaint students with the techniques and knowledge of photography and model making for presenting architectural designs.

GENERAL OBJECTIVES: On completion of this module the trainee will be able to:

1) Use photography as a means of communication and presentation of architectural works.
2) Produce simple 3D geometric forms.
3) Identify a range of materials used in model making.
4) Demonstrate safe use of model making equipment.
5) Construct models from scaled drawings as a means of communication and presentation of architectural works.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**0 – 2 – 2 – 2**
COURSE TITLE	**PHOTOGRAPHY AND MODEL-MAKING MODEL MAKING**				**COURSE CODE**	**ARC 212**
GOAL	**THIS COURSE IS INTENDED TO EQUIP THE STUDENT WITH THE TECHNIQUES AND KNOWLEDGE OF PHOTOGRAPHY AND MODEL MAKING FOR PRESENTING ARCHITECTURAL DESIGNS**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Use photography as a means of communication and presentation of architectural works.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 3			• Equipped Photography Laboratory • Various types of Camera (analog and digital) • Printer • Printing consumables • Memory cards	1.1 Identify a Camera 1.2 Illustrate the use of a camera. 1.3 Choose the correct angle for photography, taking into consideration the shade and shadow. 1.4 Take suitable photographs. 1.5 Use artificial light in photography. 1.6 Demonstrate the use of media devices like memory cards and digital cameras 1.7 Print photographs 1.8 Demonstrate the use of relevant media devices to help in prosecuting a good finish. 1.9 Demonstrate the use of artificial light in photography	• Guide student to demonstrate the use of media devices like memory cards and digital camera • Guide student to choose suitable angles for photography. • Guide student to print photographs	• Take suitable photographs with various angles. • Print photographs
GENERAL OBJECTIVE 2	Produce simple 3D geometric forms.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
4 – 5			• Marker board • Cardboard paper • Cutting knife • Glass cutting surface • Exemplars • Transparency paper	2.1 Produce outline of 3D forms using a range of materials, fit for purpose. 2.2 Construct the following forms: - Cube - Cuboid - Cone - Square-based pyramid - Triangular Prism - Octahedron -	• Guide student to produce series of 3D forms out of suitable materials. • Guide student to produce the forms.	• Construct three different 3D forms.

GENERAL OBJECTIVE 3		Identify a range of materials used in model making.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
6			• Series of mode making materials like: - Cardboards of various colours and texture - Modeling machines - Cutting knife	3.1 Illustrate model 3.2 Illustrate the materials and equipment used in model making 3.3 Identify the suitability of various materials based on: - Properties - Characteristics - Procurement - Availability 3.4 Identify a range of Adhesives used in model making, their suitability and safety 3.5 Identify a range of model making equipment and tools.	• Guide student to demonstrate 3.2 to 3.5 to student using appropriate illustrations and sketches	• List a series of modeling materials • Highlight the main advantages and disadvantages of each of the materials listed above.
GENERAL OBJECTIVE 4		Demonstrate safe use of model making equipment.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
7 – 8			• Marker board • Modeling Workshop • Suitable PPEs • Hot-air gun. • Hot wire cutter • Vac-form • Extraction systems. • Spray booth	4.1 Demonstrate Health & Safely in model making and safe use of equipment and tools.	• Guide student to demonstrate the safe use of model making equipment such as: - Hot-air gun. - Hot wire cutter - Vac-form - Extraction systems. - Spray booth • Guide student to use a selection of the equipment and materials. • Ensure that student has adequate and suitable PPE.	• Demonstrate safety guidelines in the Modeling Workshop
GENERAL OBJECTIVE 5		Construct models from scaled drawings as a means of communication and presentation of architectural works.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9 – 15			• Marker board • Modeling Workshop	5.1 Distinguish a range of models and their use in the	• Guide student through steps 5.1 to	• Assess the model of a simple house

			• Suitable PPEs • Hot-air gun. • Hot wire cutter • Vac-form • Extraction systems. • Spray booth • Cardboards of various colours and texture • Modeling machines • Cutting knife	3D design process. 2 Concept model 3 Sketch model 4 Finished model 5.1 Illustrate the various stages in model making. Illustrate the model making process. 5.2 Identify a suitable plan for which model is to be produced 5.3 Choose suitable scale for intended model 5.4 Prepare a cutting plan. 5.5 Choose materials for the various components putting colour and scale into consideration. 5.6 Cut the modelling materials into requisite scales. 5.7 Construct the model base with reference to the drawing 5.8 Form up the various components from the cut up materials. 5.9 Construct the roads and landscape items on the base. 5.10 Assemble the components on the base 5.11 Appreciate the relationship between the real project site and the model base. 5.12 Determine the location of the building on the site 5.13 Case the model for presentation.	5.14	produced by the student.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 212)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	0%
Test	At least 2 progress tests for feedback.	30%
Practical	At least 5 home works to be assessed by the teacher	70%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **BUILDING CONSTRUCTION III**

COURSE CODE: **ARC 213**

DURATION: **1 – 2 – 3 – 3**

UNITS: **3 UNITS**

GOAL: The course is designed to provide students with adequate knowledge of scaffolding, openings and finishes and their application to building site operations.

GENERAL OBJECTIVES: On completion of this course the student should:

1) Know the use of scaffolding.

2) Know the various types of fenestration in buildings.

3) Know the different types of finishes for Floors, walls, and ceilings.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 2 – 3 – 3**
COURSE TITLE	**BUILDING CONSTRUCTION III**				**COURSE CODE**	**ARC 213**
GOAL	**THE COURSE IS DESIGNED TO EQUIP THE STUDENT WITH ADEQUATE KNOWLEDGE OF SCAFFOLDING, OPENINGS AND FINISHES AND THEIR APPLICATION TO BUILDING SITE OPERATIONS.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Know the use of scaffolding.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 2	1.1 State the use of scaffolding in walls, roof and suspended roof construction. 1.2 State the procedure for providing scaffolding for the various building types.	• Explain the principles of scaffolding and the use of scaffolding in walls, roof and suspended roof construction. • Explain the procedure for providing scaffolding for the various building types.	• White board, • PowerPoint presentation and AV projection equipment.	1.1 Select various types of scaffolding and their uses 1.2 Illustrate the procedure for provision of scaffolding for various building types 1.3 Illustrate with sketches different types of scaffolding and their uses	• Guide student to sketch sketches different types of scaffolding and their uses • Guide student to know the procedure for provision of scaffolding for various building types	• What are the uses of scaffoldings in walls and roofs? • Explain the procedure for providing scaffolding for the various building types
GENERAL OBJECTIVE 2	Know the various types of fenestration in buildings.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
3 – 10	2.1 List the functional requirements of openings. 2.2 State the treatment of doors, windows and other openings in wall. 2.3 Explain the different between a flush door and a panel door 2.4 Describe the use of lintel and arches in fenestrations. 2.5 List the various types of doors. 2.6 Describe the different types of door linings. 2.7 Describe the methods of fixing door frames and linings to openings. 2.8 List the various types of metal doors and the common materials used in their construction. 2.9 List the main principles to be observed in the	• Explain the functional requirements of openings. • Explain the treatment of doors, windows and other openings in wall. • Explain the use of lintel and arches in fenestrations. • Explain the difference between a door frame and a door lining • Explain the methods of fixing doorframes and linings to openings. • Discuss the various types of metal doors and the common materials used in their construction. • Explain the method by which windows are classified.	• White board • PowerPoint presentation and AV projection equipment. • Exemplars	2.1 Demonstrate fenestration its meaning and functional requirement 2.2 Illustrate reasons and ways of treatment of opening s in walls 2.3 Illustrate use of lintel and arches in fenestrations 2.4 Differentiate between a door frame and a door lining 2.5 Identify the various components of doors and windows.. 2.6 Identify the various classification of windows and methods of construction 2.7 Illustrate the various components of doors and windows 2.8 Illustrate with sketches the method of constructing the	• Guide student to sketches different types of openings • Explain types of treatment of doors and windows openings on walls • Illustrate with sketches the use of lintel and arches in fenestrations • Describe with the aid of sketches the methods of constructing the different types of framed and flush doors. • Illustrate with the aid of sketches a flush and a panel metal door. • Illustrate with the aid	• Describe with sketches the method of constructing the various types of windows. • Differentiate between a door frame and a door lining • Differentiate between a flush and a panel metal door. •

	construction of doors and framing of joiners work in general. 2.10 List the method by which windows are classified. 2.11 Describe with sketches the method of constructing the various types of windows.	• Explain the main principles to be observed in the construction of doors and framing of joiners work in general. • Differentiate between a flush and a panel metal door.		various types of windows	of sketches various types of windows.	
GENERAL OBJECTIVE 3		Know the different types of finishes for Floors, walls, and ceilings.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
	3.1 State the functions of finishes on floors, walls, and ceilings. 3.2 Explain the different type of floor finishes in relation to their functions, e.g terrazzo, granite, PVC etc in terms of internal and external functions. 3.3 Identify the different types of ceiling finishes in relation to their functions in terms of internal and external functions. 3.4 Describe the use of various types of paints for different surfaces in relation to their finishes.	• Explain the functions of finishes on floors, walls, and ceilings. • Describe the different types of floor finishes in relation to their functions, e.g terrazzo, granite, PVC etc in terms of internal and external functions. • Explain the different types of ceiling finishes in relation to their functions in terms of internal and external functions. • Explain the use of various types of paints for different surfaces in relation to their finishes.	• White board • PowerPoint presentation and AV projection equipment • Relevant exemplars	3.1 Demonstrate the functions of finishes on floors, walls and ceilings 3.2 Show different types of ceiling finishes in relation to their functions in terms of internal and external functions. 3.3 Illustrate the use of various types of paints for different surfaces in relation to their finishes.	• Guide student to sketches the different types of floor finishes in relation to their functions, e.g terrazzo, grano, PVC etc in terms of internal and external functions. • Illustrate with sketches the different types of ceiling finishes in relation to their functions. • Guide the student to identify different types of paints in relation to the surfaces of their application	• Identify the different types of ceiling finishes. • Illustrate with sketches the different types of floor finishes

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 213)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	40%
Test	At least 2 progress tests for feedback.	10%
Practical	At least 5 home works to be assessed by the teacher	50%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **ARCHITECTURAL GRAPHICS II**

COURSE CODE: **ARC 214**

DURATION: **0 – 3 – 3 – 3**

UNITS: **3 UNITS**

GOAL: This course is designed to provide students with the required skills to produce good Architectural drawings.

GENERAL OBJECTIVES: On completion of this module the student will be able to:

1) Know the principles of perspective drawing.
2) Know the Production of Monochromatic Presentation Drawing.
3) Know the Production of Working drawing.
4) Understand the principles of shadow casting.
5) Understand the principle of modular co-ordination.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**0 – 3 – 3 – 3**
COURSE TITLE	**ARCHITECTURAL GRAPHICS II**				**COURSE CODE**	**ARC 214**
GOAL	**THIS COURSE IS DESIGNED TO PROVIDE THE STUDENT WITH THE REQUIRED SKILL TO PRODUCE GOOD ARCHITECTURAL DRAWINGS.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Know the principles of perspective drawing.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 3			• Marker Board • Marker pen • PowerPoint, AV projection equipment. • Drawing board • Drawing Instruments	1.1 Draw perspective drawind 1.2 Demonstrate correct drawing terms. 1.3 Show three dimensional drawings 1.4 Recognize how to draw three-dimensional drawings. 1.5 Demonstrate visual composition 1.6 Demonstrate the appropriate method of showing 3 'D' 1.7 Draw perspectives of simple straight and curved line objects 1.8 Demonstrate **simple 3Dsketches** using small objects, interiors, exteriors or similar subject matter. 1.9 Demonstrate one point perspectives altering the position of vanishing point and eye level 1.10 Illustrate vanishing point (VP) and observation point and their effect on the three basic lines of perspective drawing. 1.11 Show the variables in perspective drawing: - angle of object with picture plane - height of horizontal line - distance from object to	• Guide student to draw perspective drawing. • Guide the student to draw use perspective drawing as a method of communication. • Guide students to identify the following: - Center of vision - Cone of vision - Eye Level - Horizon line - Picture Plane - Height Line - Vanishing points. • Guide student to generate simple 3D freehand line drawings. • Facilitate the completion of the drawing exercise. • Guide student to: - Construct ground line, eye level and true height line in perspective. • Guide student to recognize the variables in perspective drawing: - angle of object with	• Draw accurate three dimensional drawings and give characters to their parts accurately • Construct the drawing parameters that lead to accurate perspectives.

				station point. 1.12 Draw a circle in perspective using: - Octagonal method - Tangent square method. 1.13 Draw simple objects in: - 1-point perspective - 2-point perspective 1.14 3-point perspective 1.15 Illustrate the following: - Center of vision - Cone of vision - Eye Level - Horizon line - Picture Plane - Height Line - Vanishing points	picture plane - height of horizontal line - distance from object to station point. • Guide student to draw a circle in perspective using: - Octagonal method - Tangent square method. • Guide student to draw simple objects in: - 1-point perspective - 2-point perspective - 3-point perspective	
GENERAL OBJECTIVE 2		Know the Production of Monochromatic Presentation Drawing.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
4 – 6			• Set of drawings • Set of drawing pencils • Drawing ink • Tracing paper • Set of working drawings • Set of stencils • Printing machine • Scanning machine • Photocopying machine • Computers and their printers.	2.1 Illustrate using a set of drawings and stencils to trace and stencil the given drawing 2.2 Illustrate how to draft elevation and sections, door and window schedule sanitary drawings, site plan. 2.3 Show how to trace and stencil drawings 2.4 Show how to draught properly. 2.5 Demonstrate code and reproduce drawings	• Guide student how to use a set of drawings and stencils to trace and stencil the given drawing • Guide student how to draft elevation and sections, door and window schedule sanitary drawings, site plan. • Guide student to Trace, stencil, annotate and code the drawing. • Guide student to: - code drawings - Layout drawings - Produce drawings	• Produce drawing with proper annotation of drawings • Produce working drawings for a building with specific characters

GENERAL OBJECTIVE 3		Know the Production of Working drawing.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
7 – 8			• White Board Exemplars PowerPoint, AV projection equipment. • White Board and marker pen. • Drawing board. Drawing Instruments • Drawing Studio • Drawing Papers • Pencil/pens •	3.1 Illustrate the following using the sketch plan given: - Render plan & Section - Render Site Plan, - Cast Shades and - Shadows. - Draw elevations using entourage factors. - Prepare axonometric and perspective drawings and - Cast shades & Shadows on them. 3.2 Produce presentation drawings in 2x3D 3.3 Produce working drawings	• Guide student to use the following sketch plan given: - Render plan & Section - Render Site Plan, - Cast Shades and - Shadows. - Draw elevations using entourage factors. - Prepare axonometric and perspective drawings and - Cast shades & Shadows on them. • Guide the students to produce the following using the given drawings - Site plans - Elevations - Sections - Schedules - Details, giving dimensions and specifications	• Produce presentation drawings in 2x3D • Produce working drawings
GENERAL OBJECTIVE 4		Understand the principles of shadow casting.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9 – 11			• White Board Exemplars PowerPoint, AV projection equipment. • White Board and marker pen. • Drawing board. Drawing Instruments	4.1 Demonstrate how to cast shadows and differentiate between shade and shadow. 4.2 Illustrate the principle of light transmission on solid objects. 4.3 Illustrate the various methods of casting	• Guide student how to perform the following tasks: - Pprinciple of light transmission on solid objects. - Methods of casting shadows and depicting	• Produce a composition showing positive and negative space concept. • Prepare a composition to show open, closed, and divided negative space.

			• Drawing Studio • Drawing Papers • Pencil/pens •	shadows and depicting shades 4.4 Illustrate the shades and shadows of points lines, planes and solids, curved surfaces and recess. 4.5 Apply shades and shadows in site plan and elevations of a given drawing using pencil, ink, colour 4.6 Demonstrate to students the methods of conceptualizing negative and positive space in design 4.7 Select a media to produce a composition showing positive and negative space concept. 4.8 Handle the brush and poster or water colour to show composition of empty or crowded space 4.9 Prepare a composition using any medium to show open, closed, and divided negative space	shades - Shades and shadows of points lines, planes and solids, curved surfaces and recess. - Apply shades and shadows in site plan and elevations of a given drawing using pencil, ink, colour - Methods of conceptualizing negative and positive space in design.	
GENERAL OBJECTIVE 5		Understand the principle of modular co-ordination.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
12 – 15			• White Board Exemplars PowerPoint, AV projection equipment. • White Board and marker pen. • Drawing board. Drawing Instruments • Drawing Studio • Drawing Papers • Pencil/pens	5.1 Demonstrate modular draughting methods and conventions 5.2 Prepare architectural drawings using modular draughting techniques for the design above. 5.3 Provide references and notations on all drawings 5.4 Perform how the modular co-ordination is used in prefab production. 5.5 Show the range of	• Guide student how to prepare a good architectural drawings using modular draughting techniques for the design with references and notation • Guide student how to use the modular co-ordination in prefab production.	• Use modular drafting to produce a good Architectural drawing •

				tolerances for on-site laying of components 5.6 Illustrate the principle of modular co-ordination 5.7 Use the principle of modular co-ordination 5.8 Produce good Architectural drawings	• Exhibit student work in a public viewing space.	

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 214)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	0%
Test	At least 2 progress tests for feedback.	30%
Practical	At least 5 home works to be assessed by the teacher	70%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **STRENGTH OF MATERIALS**

COURSE CODE: **ARC 215**

DURATION: **1 – 2– 3 – 3**

UNITS: **3 UNITS**

GOAL: This course is designed to provide students with the required skill to produce good Architectural drawings

GENERAL OBJECTIVES: On completion of this module the student will be able to:

1) Understanding Dynamics using Newton's Laws of motion.
2) Understand the relations between stress and strain.
3) Understand station and graphical resolution of forces.
4) Determine reactions, Bending Moments, shear force values.
5) Understand moments of inertia, Products of Inertia Max & Min Principal Axis, Neutral Axis, and Bending. Stress, shear stress.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 2– 3 – 3**
COURSE TITLE	**STRENGTH OF MATERIALS**				**COURSE CODE**	**ARC 215**
GOAL	**THIS COURSE IS DESIGNED TO PROVIDE THE STUDENT WITH THE REQUIRED SKILL TO PRODUCE GOOD ARCHITECTURAL DRAWINGS**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Understanding Dynamics using Newton's Laws of motion.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 3	1.1 Explain Newton's Law of Motion and their appreciation. 1.2 Differentiate between impulse and momentum. 1.3 Define Kinetic Energy. 1.4 Identify Kinematics of Points. 1.5 Analyze the composition and resolution of velocities and Acceleration. 1.6 Differentiate relative Velocity and acceleration. 1.7 Present representation by vectors.	• Discuss Laws of Motion through the use of question and answer • Demonstrate the application of Law by using an object at "rest" and an object in Motion. • Differentiate between impulse and momentum. • Define Kinetic Energy. • Identify Kinematics of points. • Define relative Velocity. • Differentiate relative Velocity and acceleration. • Explain Vectors • Explain representation by Vectors.	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars • Calculators • Recommended text books			• Define Newton's Law of Motion • Differentiate relative Velocity and acceleration. • Differentiate between impulse and momentum.
GENERAL OBJECTIVE 2	Understand the relations between stress and strain.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
4 – 5	2.1 Define load. 2.2 Explain tension and compression forces. 2.3 Explain stress and strain 2.4 Define Hooke's Law. 2.5 Explain Modulus of Elasticity. 2.6 Explain the relation between stress and strain in tension. 2.7 Define limit of	• Define load • Explain tension and compression forces. • Explain stress and strain. • Define Hook's law • Explain Modulus of elasticity • Explain the relationship between	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars • Calculators • Recommended text books	2.1 Illustrate the method of analysis of composite body with axial tension or compression 2.2 Illustrate shear stress, shear strain, Modulus of Rigidity, strain energy.	• Guide student to Illustrate the method of analysis of composite body with axial tension or compression • Demonstrate shear stress, shear strain, Modulus of Rigidity, strain energy.	• Define Hooke's Law. • Explain tension and compression forces. • Explain the relation between stress and strain in tension. • Explain shear stress, shear strain, modulus of rigidity, strain energy.

	proportionality, elastic limit, yield point, ductility, brittleness and permanent set. 2.8 Explain shear stress, shear strain, modulus of rigidity, strain energy.	stress and strain in tension. • Define limit of proportionality, elastic limit, yield point, ductility brittleness, and permanent set. • Explain shear stress, shear strain, Modulus of Rigidity, strain energy.				• Illustrate shear stress, shear strain, Modulus of Rigidity, strain energy.
GENERAL OBJECTIVE 3		Understand station and graphical resolution of forces.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
6 – 8	3.1 Define equilibrium of concurrent and non-concurrent co-planar forces. 3.2 Illustrate Polygon of forces. 3.3 Analyze resolution of forces.	• Discuss concurrent forces • Discuss non-concurrent forces. • Use graphical method to resolve these forces. • Use sketches to show Polygon of Forces	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars • Calculators • Recommended text books	3.1 Use graphical method to resolve forces into components or parts 3.2 Use sketches to show Polygon of Forces 3.3 Use graphical method to resolve forces into components or parts	• Guide student to use graphical method to resolve forces into components or parts • Use sketches to show Polygon of Forces • Guide student to use graphical method to resolve forces into components or parts	• Define equilibrium of concurrent and non-concurrent coplanar forces. • Use sketches to show Polygon of Forces
GENERAL OBJECTIVE 4		Know how to determine reactions, Bending Moments, shear force values.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9 – 11	4.1 Define bending moments and shear force. 4.2 Describe types of loads, and types of support. 4.3 Write the equation of equilibrium. 4.4 Illustrate sign conventions for bending moment and shear force diagrams. 4.5 Determine the relations between load, shear force and bending moment. 4.6 Calculate shear force and bending moment values on: - Simple supported beam and - Cantilever beam with	• Discuss bending moments and shear force. • Explain types of load, and types of support • Explain the equation of equilibrium. • Explain sign conventions for bending moment and shear forces diagram • Explain bending moment and shear force diagrams.	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars • Calculators • Recommended text books	4.1 Apply bending moments and shear force. 4.2 Perform exercises with varying types of loads, and types of support. 4.3 Illustrate types of support such as fixed hinge and Roller supports. 4.4 Draw bending moment and shear force diagram. 4.5	• Guide student to illustrate varying types of loads and types of supports • Guide student how to draw bending moment and shear force diagrams using graphical method.	• Describe types of loads, and types of support. • Calculate shear force and bending moment • Draw bending moment and shear force diagram.

	concentrated and uniformly distribution loads (UDC)					
GENERAL OBJECTIVE 5		Understand moments of inertia, Products of Inertia Max & Min Principal Axis, Neutral Axis, and Bending. Stress, shear stress.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
	5.1 Explain general principles of simple bending. 5.2 Determine the position of neutral axis. 5.3 Calculate moments of inertia. 5.4 Determine bending stresses in Beam sections. 5.5 Calculate combined bending and direct stress. 5.6 Determine shear stresses in rectangular Beam sections. 5.7 Determine moment of inertia about an axis, maximum and minimum values of inertia about the principal axis.	• Explain general principles of simple bending. • Discuss 5.2 to 5.7	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars • Calculators • Recommended text books	5.1 Illustrate general principle bending. 5.2 Use graphical method of determination of position of neutral axis, bending stresses in beam section. 5.3 Calculate moments of inertia. 5.4 Calculate combined bending and direct stress. 5.5 Determine shear stresses in rectangular Beam sections. 5.6 Determine moment of inertia about an axis, maximum and minimum values of inertia about the principal axis.	• Illustrate 5.1 to 5.6 to the student. • Apply shear stresses in rectangular Beam sections. • Demonstrate moment of inertia about an axis, maximum and minimum values of inertia about the principal axis.	• Calculate combined bending and direct stress. • Calculate combined bending and direct stress. • Determine moment of inertia about an axis, maximum and minimum values of inertia about the principal axis.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 215)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN INTERIOR DESIGN**

COURSE TITLE: **COMPUTER AIDED DESIGN (2D)**

COURSE CODE: **ARC 216**

DURATION: **0 – 3 – 3 – 3**

UNITS: **3 UNITS**

GOAL: This course is designed to provide students with an understanding of the basic principles of drawing using Computer Aided Design (CAD).

GENERAL OBJECTIVES: On completion of this module the student will be able to:

1) Deduce working knowledge and skills about drawing concepts and techniques using AutoCAD computer software.

2) Understand the methods and patterns of development for simple geometrical shapes.

3) Deduce the intersection lines for intersected cylinders.

4) Create technical drawings in a specialist field.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**0 – 3 – 3 – 3**
COURSE TITLE	**COMPUTER AIDED DESIGN (2D)**				**COURSE CODE**	**ARC 216**
GOAL	**THIS COURSE IS DESIGNED TO DEVELOP AN UNDERSTANDING OF THE BASIC PRINCIPLES OF DRAWING USING COMPUTER AIDED DESIGN (CAD).**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Gain working knowledge and skills about drawing concepts and techniques using AutoCAD computer software.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 5			• Marker board • Smart board • Computer systems • Relevant Computer Aided Design Software • Exemplars • Overhead projector • Demo videos	1.1 Use program commands and files. 1.2 Use of program commands and files. 1.3 Draw and modify two dimensional technical drawings. 1.4 Annotate technical drawings. 1.5 Apply CAD skills in a specialist field	• Access current AutoCAD program • Explain Standard Windows Toolbars • Explain the Main drawing tools (pull down menus) – file, edit, view, insert, format, tools, draw, dimensions, modify. • Illustrate the following: - Layer toolbar - Shortcut commands - (X and Y) on screen & co-ordinates - Model and Paper space - Scale 1:1 and printing scales - Command prompts box - Bottom tabs & set for drawing – snap, grid, ortho, osnap, otrack - Drawing lines – basics - Control of mouse - Demonstrate and explain - Offset, mirror, chamfer, fillet &	• List 10 commands use in AutoCAD • Using the line, offset, Chamfer, fillet, trim, circle and hatch commands draw a simple two dimensional (2D) of a rectangle, square and circle. • Create layers for walls, floors, windows and doors • Dimension and label a 2-D drawing of a gate house (plan) using the dimension and text commands • Draw 2 dimensional drawings of a gate house using the knowledge acquired in AutoCAD. • Name, save and print the exercise on A4 paper

					hatch. - Printing procedure. - Layering - Demonstrate how to annotate - Dimensions - Text/ information • Ask student to name, save exercise(s) and print/ plot on large plan plotter.	
GENERAL OBJECTIVE 2		Understand the methods and patterns of development for simple geometrical shapes.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
6 – 7			• Marker board • Smart board • Computer systems • Relevant Computer Aided Design Software • Exemplars • Overhead projector • Demo videos	2.1 Practice the principles and methods of surface development. 2.2 Develop simple 3D geometric shapes i.e. cylinders, cones and pyramids.	• Explain the principles and methods of surface development. • Demonstrate how to create simple 3D geometric shapes i.e. cylinders, cones and pyramids. • Demonstrate and explain how to create simple 3D forms within a specialist field – architecture, interior design, construction etc. • Provide simple practical exercise(s) • Ask student to name, save appropriately.	• Using polylines. Explode, extrude and other 3D commands create a cylinder, a cone and a pyramid. • Create a 3D drawing of a simple 2-Bedroom Bungalow using AutoCAD • Create a file, name and save the exercise
GENERAL OBJECTIVE 3		Deduce the intersection lines for intersected cylinders.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
8 – 9			• Marker board • Smart board • Computer systems • Relevant Computer Aided Design Software • Exemplars	3.1 Draw the intersection line of all cases of intersected cylinders (Equal right cylinders, unequal right cylinders, equal other than 90 cylinders and unequal other than 90 cylinders.	• Demonstrate how to draw the intersection line of all cases of intersected cylinders (Equal right cylinders, unequal right cylinders, equal	• Using 3D drawings intersect 2 equal right cylinders at an angle of 90 degrees and also at an angle of 60 degrees. • Using 3D drawings

			• Overhead projector • Demo videos		other than 90 cylinders and unequal other than 90 cylinders. • Guide student to draw the intersection line of all cases of intersected cylinders (Equal right cylinders, unequal right cylinders, equal other than 90 cylinders and unequal other than 90 cylinders.	intersect 2 unequal right cylinders at an angle of 90 degrees and also at an angle of 60 degrees.
GENERAL OBJECTIVE 4		Create technical drawings in a specialist field.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
10 – 15			• Marker board • Smart board • Computer systems • Relevant Computer Aided Design Software • Exemplars • Overhead projector • Demo videos	4.1 Identify the main features of the six views of an object. 4.2 Draw the three views of an object in first and third angle projections. 4.3 Identify the inter-relation between the three views of an object. 4.4 Deduce the third missing view from given two views of an object. 4.5 Identify the inter-relation between the three views of an object. 4.6 4.4 Deduce the third missing view from given two views of an object.	• Explain the main features of the six views of an object or space within a specialist field. • Demonstrate and explain the inter-relation between the three views of an object. • Continue & support the practical exercise within a specialist field • Guide student to deduce the Third missing view from given two views of an object. • Guide student to revise printing procedure. • Ask students to name, save exercise(s) and print/	• With the means of a 3D drawing label the six views of a cuboid • Create a file, name and save the exercise • Use first and third angle projections to draw 2 cuboids intersecting at an angle of 90 degrees. • Create the third missing view of 2 cuboids intersected at an angle of 90 degrees • Create a 3D drawing from a 2D drawing of a simple 2-Bedroom Bungalow • Create a file, name, print on A3 and save the exercise.

					plot on large plan plotter.	

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 216)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	0%
Test	At least 2 progress tests for feedback.	30%
Practical	At least 5 home works to be assessed by the teacher	70%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **BUILDING SERVICES**

COURSE CODE: **ARC 217**

DURATION: **1 – 2– 3 – 3**

UNITS: **3 UNITS**

GOAL: This course is designed to inculcate in the students the importance of building services to human comfort in buildings

GENERAL OBJECTIVES: On completion of this module the student will be able to:

1) Know the system of water supply.
2) Understand the plumbing system in a simple building.
3) Understand the principle of ventilation in buildings.
4) Understand lighting in buildings.
5) Understand electrical distribution in buildings.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 2– 3 – 3**
COURSE TITLE	**BUILDING SERVICES**				**COURSE CODE**	**ARC 217**
GOAL	**THIS COURSE IS DESIGNED TO INCULCATE IN THE STUDENT THE IMPORTANCE OF BUILDING SERVICES TO HUMAN COMFORT IN BUILDINGS**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Know the system of water supply.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 4	1.1 State the various sources of water and its use in buildings. 1.2 List the methods of water treatment and storage. 1.3 Name the various water supply systems 1.4 Describe the various water supply systems	• Discuss the various sources of water and its use in buildings using relevant examples and sketches • Explain the methods of water treatment and storage. • Explain the various water supply systems • Discuss the various water supply systems	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars			• List the methods of water treatment and storage. • Describe the various water supply systems
GENERAL OBJECTIVE 2	Understand the plumbing system in a simple building.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
5 – 8	2.1 Describe the uses of different fixtures in a toilet and kitchen 2.2 Describe private sewage disposal using septic tank and soak-away pit.	• Explain the uses of different fixtures in a toilet and kitchen • Describe private sewage disposal using septic tank and soak-away pit.	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars	2.1 Draw a pipe layout of storm and waste water disposal. 2.2 Draw a pipe layout of sewage disposal and venting system. 2.3 Draw a plumbing system for a simple residential building. 2.4 Illustrate private sewage disposal using septic tank and soak-away pit	• Guide student to: - Draw a pipe layout of storm and waste water disposal - Draw a pipe layout of sewage disposal and venting system. - Draw a plumbing system for a simple residential building. - Illustrate private sewage disposal using	• Describe the uses of different fixtures in a toilet and kitchen • Draw a plumbing system for a simple residential building.

					septic tank and soak-away pit	
GENERAL OBJECTIVE 3		Understand the principle of ventilation in buildings.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9 – 11	3.1 Describe ventilation requirements in various types of buildings. 3.2 Reproduce mechanical ventilation systems in buildings. 3.3 Illustrate various ventilation and fume extraction system	• Explain ventilation requirements in various types of buildings. • Explain mechanical ventilation system in buildings • Analyze various ventilation and fume extraction systems	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars			• Describe ventilation requirements in various types of buildings.
GENERAL OBJECTIVE 4		Understand lighting in buildings.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
12 – 13	4.1 State level of lighting required for different functions and spaces in a residential building 4.2 Define the principles of natural lighting and fenestration 4.3 State the different types of lighting	• Demonstrate level of lighting required for different functions and spaces in a residential building. • Explain the principles of natural lighting and fenestration • Explain different types of lighting	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars			• Define the principles of natural lighting and fenestration • List the different types of lighting
GENERAL OBJECTIVE 5		Understand electrical distribution in buildings.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
14 – 15	5.1 Enumerate the various electrical elements used in a building. 5.2 Explain electricity distribution in a simple building 5.3 Identify the protection systems for the electrical system in a building.	• List the various electrical elements used in a building. • Explain electricity distribution in a simple building • State the protection systems for the electrical system in a building.	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars	5.1 Draw an electrical distribution network of a simple building.	• Guide student to draw an electrical distribution network of a simple building.	• Enumerate the various electrical elements used in a building. • Draw an electrical distribution network of a simple building.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 217)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **TECHNICAL REPORT WRITING**

COURSE CODE: **ARC 218**

DURATION: **1 – 0 – 1 – 1**

UNITS: **1 UNIT**

GOAL: This course is designed to build the student's skill towards good technical reports.

GENERAL OBJECTIVES: On completion of this module the student should:

1) Identify various reports used in architecture.
2) Know the circumstances in which each type of report is written.
3) Know how citations and references are made.
4) Write good technical reports.
5) Understanding the methodology and sequence of writing technical reports.
6) Understand the information that is required in technical report writing.
7) Know how to write Citation and Referencing.
8) Write a Technical report

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 0 – 1 – 1**
COURSE TITLE	**TECHNICAL REPORT WRITING**				**COURSE CODE**	**ARC 218**
GOAL	**THIS COURSE IS DESIGNED TO BUILD THE STUDENT'S SKILL TOWARDS GOOD TECHNICAL REPORTS.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Identify various reports used in architecture.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 3	1.1 Explain the meaning of technical report 1.2 Explain various reports used in architecture 1.3 Identify the purpose of technical reports 1.4 Explain the qualities of a good technical report	• Explain the term technical report • Describe various reports used in architecture • Discuss a clear definition with key words • Discuss purposes of writing a technical report: such as to recommend action, record purposes etc.	• Marker board • PowerPoint presentation and AV projection equipment. • Recommended text books • Calculators	1.1 Demonstrate various reports used in architecture 1.2 Illustrate the purposes of writing a technical report: such as to recommend action, record purposes etc 1.3 Show the purpose of technical report writing in Architecture 1.4 Illustrate how to write quality reports with accuracy, clarity, brevity.	• Guide student to understand the meaning of technical report • Give assignment to student how to write Technical report with examples on planning recommendations, action, stage of work, materials description, record purposes etc • Guide student how to write quality reports with accuracy, clarity, brevity, etc	• Explain the purpose of technical reports • Write a quality report with accuracy, clarity, brevity, etc.
GENERAL OBJECTIVE 2	Know the circumstances in which each type of report is written.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
4 – 7	2.1 Define feasibility report. 2.2 Explain Design Proposal report 2.3 Explain Progress report 2.4 Explain Condition survey report 2.5 Explain Tender appraisal report 2.6 Explain Special reports	• Explain feasibility report • Discuss proposal report • Explain progress report • Explain condition survey report • Explain tender appraisal report • Explain special report • Discuss the Purpose and content of each of these reports	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars • Recommended text books • Calculators	2.1 Write feasibility report 2.7 Write Design Proposal report 2.8 Write Progress report 2.9 Write Condition survey report 2.10 Write Tender appraisal report 2.2 Write Special reports 2.3 Write feasibility report and design Proposal report. 2.4 Write a progress report and Condition survey report. 2.5 Write good tender appraisal report and special reports 2.6 Demonstrate with examples of each of these	• Guide student how to write: - feasibility report - design proposal report - progress report - condition survey report - tender appraisal report - special report	• What is the different between feasibility report and design proposal report/ • Explain tender appraisal report • Write Design Proposal report • Write a progress report and Condition survey report.

				types of reports as written by architectural firms 2.7 Show samples each of these types of reports as written by architects		

GENERAL OBJECTIVE 3		Know how citations and references are made.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
8	3.1 Explain components of a technical report. 3.2 Explain the followings: - Front Matter or Before the Report. - Body or Within the Report - End Matter or After the Report	• Explain the preliminary sections of a report such as Title and Executive summary • Discuss aspects of the main body of a report to include Introduction, Theoretical background, data presentation and analysis, discussion and conclusion • Explain references and appendices	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars • Recommended text books • Calculators	3.1 Show the components of a technical report	• Guide the student on skills of good Front matter, Main body and End matter of report writing	• Explain the components of a good technical report
GENERAL OBJECTIVE 4		Write good technical reports.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9 – 10	4.1 Explain how to write reports for the following types of audience: - Managers - Expert - Technicians - Laypersons - Combined audience	• Discuss the levels of knowledge and what each of these audiences expects in a technical report. • Explain strategies to adopt in writing reports for each type of audience.	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars • Recommended text books • Calculators	4.1 Demonstrate how to write reports for different categories of people like: - Managers - Expert - Technicians - Laypersons - Combined	• Guide student to write reports for different types of audience.	• Explain strategies to adopt in writing reports for each type of audience.
GENERAL OBJECTIVE 5		Understanding the methodology and sequence of writing technical reports.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
11	5.1 Explain the methodology and sequence of writing technical reports.	• Discuss the following in technical reports: - Choice of topic and title	• Marker board • PowerPoint presentation and AV projection	6.1 Illustrate the methodology and sequence of writing technical reports. 6.2 Demonstrate the various	• Guide student how to write technical report writing through determination of	• What are the methodology and sequence in technical report writing?

		- Justification of title - Abstract or synopsis of the report - Aim and objectives of the report - Collection & classification of data - Scope and limitation of project - Terms of reference	equipment. • Exemplars • Recommended text books • Calculators	stages of technical report writing from determination of topic and title, justification of title, abstract, aim and objective, data collection and analysis, scope and limitations, terms of reference etc	topic and title, justification of title, abstract, aim and objective, data collection and analysis, scope and limitations, terms of reference etc	• Write a technical report
GENERAL OBJECTIVE 6		Understand the information that is required in technical report writing.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
12	6.1 Explain the information that is required in technical report writing	• List the Information required in technical report writing. • Explain the difference between facts and opinions. • Explain how fact and opinions may be distinguished in writing reports. • Discuss sources of information: - Primary - Secondary - Tertiary • Explain data collection & presentation (graphical, tabular and descriptive methods)	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars • Recommended text books • Calculators	6.1 Show sources of information. 6.2 Illustrate the type of information necessary for report writing, data collection and analysis	• Guide student to collect relevant data, analyse and present the data in an organised format.	• Explain the difference between facts and opinions. • Explain the information that is required in technical report writing
GENERAL OBJECTIVE 7		Know how to write Citation and Referencing.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
13	7.1 Write Citation and Referencing	• Explain how to write citations in the text and list of references using different styles with emphasis on American Psychological Association (APA) style	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars • Recommended text books	7.1 Write citations in the text and list of references using different styles.	• Guide the student how to write citations in the text of his reports or project and a list of references using different styles with emphasis on American	• Write good citation & reference

			• Calculators		Psychological Association (APA) style	

GENERAL OBJECTIVE 8		Write a Technical report				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
14 – 15	8.1 Explain how to write a technical report on a given topic	• Explain the process of writing a technical report on a given area of interest with the students	• Marker board • PowerPoint presentation and AV projection equipment. • Exemplars • Recommended text books • Calculators	4.1 Write a good technical report	• Guide student how to write a good technical report using a given topic.	• Write a good technical report

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	**PURPOSE AND NATURE OF ASSESSMENT (ARC 218)**	**WEIGHING**
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **WORKSHOP PRACTICE AND TECHNOLOGY III**

COURSE CODE: **BLD 205**

DURATION: **0 – 3 – 3 – 3**

UNITS: **3 UNITS**

GOAL: This course is designed to acquaint students with the knowledge of painting and decoration.

GENERAL OBJECTIVES: On completion of this module the trainee will be able to:

1) Know painting and decoration and their effects on buildings.
2) Understand the Preservative Characteristics of Paint.
3) Understand Paintwork.
4) Know some Plumbing Tools and Equipment
5) Understand Factory Acts and Safety Regulations Applicable in the plumbing Workshop.
6) Identify Plumbing Materials for various Jobs Purposes.
7) Understand Water Supply.
8) Know the different methods of installing and fixing appliances.
9) Understand Drainage Systems.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**0 – 3 – 3 – 3**
COURSE TITLE	**WORKSHOP PRACTICE AND TECHNOLOGY III**				**COURSE CODE**	**BLD 205**
GOAL	**THIS COURSE IS DESIGNED TO EQUIP THE STUDENT WITH THE KNOWLEDGE OF PAINTING AND DECORATION.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Know painting and decoration and their effects on buildings					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 3			• Equipped Painting, Decoration and Glazing Workshop • Paints of different types • Marker boards • Exemplars • Relevant text books • PowerPoint presentation and AV projection equipment.	1.1 Analyze the components of paint. 1.2 Select the main types of paint in use. 1.3 Identify specific peculiarities; i.e. emulsion, oil etc. 1.4 Illustrate the peculiarities associated with each paint type and their usage.	• Guide the student to select the main paint in use and their special peculiarities e.g emulsion, gloss, etc	• Itemize the peculiarities associated with each paint type and their usage. • List three kinds of paint in use.
GENERAL OBJECTIVE 2	Understand the Preservative Characteristics of Paint.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
4			• Equipped Painting, Decoration and Glazing Workshop • Paints of different types • Marker boards • Exemplars • Relevant text books • PowerPoint presentation and AV projection equipment.	2.1 Identify the preservation characteristics of paint 2.2 Identify the main additives, which are available for use as preservative and weathering preventive treatment. 2.3 Mix paint to the right constituents for application using brush, roller or spray gun. 2.4 Identity additives, which are available for, use as preservative and weathering preventive treatment. 2.5 Illustrate the preservation characteristics of paint, i.e. moisture prevention, rust prevention, etc	• Guide student to Mix paint to the right constituents for application using brush, roller or spray gun. • Guide student how to Identity additives which are available for use as preservative and weathering preventive treatment.	• List three additives which are available for use as preservative and weathering preventive treatment. • Mix paint to the right constituents for application.

GENERAL OBJECTIVE 3		Understand Paint work.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
5			• Equipped Painting, Decoration and Glazing Workshop • Paints of different types • Marker boards • Exemplars • Relevant text books • PowerPoint presentation and AV projection equipment.	3.1 Show the defects in paint work and their causes and remedies. 3.2 Identify the defects in paint work.	• Guide student to identify defects in paint	• List five defects in paint work and their causes and remedies.
GENERAL OBJECTIVE 4		Know some Plumbing Tools and Equipment.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
6			• Equipped Painting, Decoration and Glazing Workshop • Paints of different types • Marker boards • Exemplars • Relevant text books • PowerPoint presentation and AV projection equipment.	4.1 Identify plumbing tools and equipment. 4.2 Select plumbing tools and equipment for use. 4.3 Use the tools in 4.1 and portable power tools and equipment. 4.4 Maintain the tools used in 4.2 above	• Guide student how to identify and select appropriate plumbing tools and equipment for use • Maintain plumbing tools and equipment	• List five basic plumbing tools used in a simple house construction.
GENERAL OBJECTIVE 5		Understand Factory Acts and Safety Regulations Applicable in the plumbing Workshop.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
7			• Equipped Painting, Decoration and Glazing Workshop • Paints of different types • Marker boards • Exemplars • Relevant text books • PowerPoint presentation and AV projection	5.1 Perform the Safety and Upkeep of a Workshop. 5.2 Propose adequate ventilation for the workshop. 5.3 Create safe storage facilities for tools and first aid equipment	• Guide student to create safe storage facilities for tools and first aid equipment.	• Describe the Safety and Upkeep of a Workshop

			equipment.			
GENERAL OBJECTIVE 6		Identify Plumbing Materials for various Jobs Purposes.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
8 – 10			• Equipped Painting, Decoration and Glazing Workshop • Paints of different types • Marker boards • Exemplars • Relevant text books • PowerPoint presentation and AV projection equipment.	6.1 Identify the pipes and tubes used in plumbing works 6.2 Select pipes and tubes used in plumbing work for cold water, waste, soil and ventilation pipe, drainage and domestic control heating 6.3 Identify pipe sizes, weights and gauges. 6.4 Apply methods of jointing, manipulation and fixing 6.5 Prepare threading and jointing pipes in galvanised iron copper and plastics	• Guide student to select pipes and tubes used in plumbing work for cold water, waste, soil and ventilation pipe, drainage and domestic control heating. • Guide student to identify pipe sizes, weights and gauges, apply methods of jointing, manipulation and fixing, and prepare threading and jointing pipes in galvanised iron copper and plastics.	• Identify the pipes and tubes used in plumbing works • Select pipes and tubes used in plumbing work for cold water, waste, soil and ventilation pipe, drainage and domestic control heating
GENERAL OBJECTIVE 7		Understand Water Supply.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
11 – 12			• Equipped Painting, Decoration and Glazing Workshop • Paints of different types • Marker boards • Exemplars • Relevant text books PowerPoint presentation and AV projection equipment.	7.1 Illustrate the properties of water based on common sources of supply. 7.2 Demonstrate the rules to be followed in piping for water supply. 7.3 Connect water mains source	• Show student properties of water based on common sources of supply. • Guide student how to connect to the cold and hot supply	• Show connection to water main
GENERAL OBJECTIVE 8		Know the different methods of installing and fixing appliances.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
13			• Equipped Painting, Decoration and Glazing Workshop • Paints of different	8.1 Identify plumbing constructional features. 8.2 Select sanitary appliances, fittings, soil/water, and	• Guide student to install sanitary appliances, fittings, soil/water, and	• Install sanitary appliances, fittings, soil/water, and ventilation pipes.

			types • Marker boards • Exemplars • Relevant text books PowerPoint presentation and AV projection equipment.	ventilation pipes.	ventilation pipes.	
GENERAL OBJECTIVE 9		Understand Drainage Systems.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
14 – 15			• Equipped Painting, Decoration and Glazing Workshop • Paints of different types • Marker boards • Exemplars • Relevant text books PowerPoint presentation and AV projection equipment	9.1 Illustrate general layout and construction method of drainage systems. 9.2 Differentiate between private and public sewage systems.	• Guide student to layout and construct drainage systems. • Guide student to test drains and solid pipes.	• Differentiate between private and public sewage systems.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (BLD 205)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	0%
Test	At least 2 progress tests for feedback.	30%
Practical	At least 5 home works to be assessed by the teacher	70%
TOTAL WEIGHT		**100**

ARCHITECTURAL TECHNOLOGY

ND II

SECOND SEMESTER COURSES

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **ARCHITECTURE DESIGN PROJECT AND REPORT**

COURSE CODE: **ARC 221**

DURATION: **1 – 5 – 6 – 6**

UNITS: **6 UNITS**

GOAL: This course is designed to provide students with knowledge and skills to design a simple project.

GENERAL OBJECTIVES: On completion of this module the student will be able to:

1) Express his design ability through a simple project.

2) Know the processes and techniques required in communicating design information to others within the construction team.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 5 – 6 – 6**
COURSE TITLE	**ARCHITECTURE DESIGN PROJECT AND REPORT**				**COURSE CODE**	**ARC 221**
GOAL	**THIS COURSE IS INTENDED TO EQUIP THE STUDENT WITH ABILITY TO EXPRESS HIS DESIGN ABILITY THROUGH A SIMPLE PROJECT.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Express his design ability through a simple project.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 2			• Marker board • PowerPoint presentation and AV projection equipment. • PC linked to interactive Whiteboard • Exemplars • Computer systems	1.1 Illustrate the design process and its relationship to the design of buildings. 1.2 Analyze human activities space organization and interaction in designing a simple building. 1.3 Illustrate the Design Team and the lines of communications 1.4	• Guide student to prepare a brief for a simple commercial or residential building types	• Explain process of design • Illustrate the process of taking and writing of a design brief
GENERAL OBJECTIVE 2	Know the processes and techniques required in communicating design information to others within the construction team.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
3 – 15			• Marker board • PowerPoint presentation and AV projection equipment. • PC linked to interactive Whiteboard • Exemplars • Computer systems	2.1 Analyze human activities, space organization and interaction in designing a simple building. 2.2 Justify design rationale 2.3 Carryout a site analysis 2.4 Produce circulation and bubble diagrams to show the space organization and interaction for the chosen building type. 2.5 Prepare sketch design 2x3D 2.6 Prepare presentation drawings. 2.7 Prepare working drawings 2.8 Prepare details, service drawings and architectural models 2.9 Prepare architectural models 2.10 Demonstrate procedure of	• Guide to student identify human activities, circulation and time factor such as: - 3-Bedroom bungalow - 2-Bed flat - Chemist shop - Restaurant - Any other • Guide student to analysis a proposed proposed site. • Guide student to sketch activities, circulation and bubble diagram to show the space organization and interaction for the chosen building type.	• Explain how specific activities define building types. • Produce a design in response to the natural features of the site. • Show the functional flow of a design as a determinant of design success. • Produce a graphic presentation that communicates design. • Show the compatibility of architectural and engineering drawings. • Show the build ability of designs

				designing simple structures. 2.11 Prepare visual/ client presentation	• Show how to analyse and the evaluation of user requirements. • Show how to produce sketch design 2x3D, presentation drawings and working drawings • Show student how to construct details, and relate them to service drawings. • Guide student to Produce construction details and a written report • Facilitate project development towards completion. • Assist in the production of a sample board. • Assist project conclusion as necessary with the student: technical drawing, perspectives, etc.	

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 221)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	0%
Test	At least 2 progress tests for feedback.	30%
Practical	At least 5 home works to be assessed by the teacher	70%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **SITE MANAGEMENT**

COURSE CODE: **ARC 222**

DURATION: **1 – 1 – 2 – 2**

UNITS: **2 UNITS**

GOAL: This course is intended to create awareness in students, the ability to manage and coordinate an average site.

GENERAL OBJECTIVES: On completion of this module the trainee will be able to:

1) Know the activities involved in site administration.
2) Know how to organize labour for building construction works.
3) Know the basic principles of incentive for worker.
4) Understand the structural problems in site management and organization.
5) Understand the principles that govern effective communication in public and human relation.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 1 – 2 – 2**
COURSE TITLE	**SITE MANAGEMENT**				**COURSE CODE**	**ARC 222**
GOAL	**THIS COURSE IS INTENDED TO CREATE AWARENESS IN THE STUDENTS, THE ABILITY TO MANAGE AND COORDINATE AN AVERAGE SITE.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Know the activities involved in site administration.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 5	1.1 Identify the effects of efficient site administration. 1.2 Explain how to execute site management functions with respect to given task. 1.3 Explain the principles of administration and control 1.4 Discuss the effects of efficient site administration 1.5 Explain Safe working conditions for mechanical plant, etc. .	• Explain the principles of administration and control. • Explain the effects of efficient site administration. • Explain site management functions with respect to the following: - Preparation of schedules. - Forecasting material requirements. - Processing and ordering. - Storage, protection, transport, loading and handling. - Forecasting, overall programmes, short term programmes, forecast target. - Reports to head office. - Day works, variations, progress reports. - Time books, wages sheet. - Material log books. - Mechanical plant requirements. - Scaffolding (types	• Marker board • Relevant textbooks • Exemplars • PowerPoint presentation and AV projection equipment.	1.1 Carry out statutory inspections to excavation, scaffolding, hoist cranes, portable, electric equipment. 1.2 Carry out maintenance and inspection. 1.3 Ensure safe working conditions for mechanical plant etc. 1.4 Illustrate how to execute site management functions with respect to given tasks like: - Preparation of schedule - Forecasting material requirements - Processing and ordering - Storage, protection, transport, loading and handling - Reports to head office - Day works, variations, progress reports - Time books, wages sheet - Material log books - Mechanical plant requirements - Scaffolding - Statutory inspections to excavation, hoist cranes, portable equipment - (m) Maintenance and inspection	• Guide student to carry out statutory inspections to excavation, scaffolding, hoist cranes, etc • Guide student to perform site management functions	• Identify the effects of efficient site administration. • Explain how to execute site management functions. • List Safe working conditions for mechanical plant.

		and erection)		1.5 List Safe working conditions for mechanical plant, etc.		
GENERAL OBJECTIVE 2		Know how to organize labour for building construction works.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
6 – 9	2.1 Determine labour requirements. 2.2 Explain labour forecasting. 2.1 List financial and non-financial incentives	• Explain the need for labour output. • Explain division of labour. • Explain the use of programme progress chart. • Explain labour forecasting. • Explain method of recruitment of labour	• PowerPoint presentation and AV projection equipment • Marker board • Duster • Calculators • Recommended text books	2.2 Demonstrate how to construct a bar chart and network analysis	• Guide student to to construct a bar chart and network analysis	• Explain the need for labour output. • Explain the general principles of incentive schemes • Explain labour forecasting.
GENERAL OBJECTIVE 3		Know the basic principles of incentive for workers.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
10 – 12	3.1 Explain incentives as applicable to workers 3.2 Name the general principles of incentive schemes. 3.3 List financial and non-financial incentives.	• Explain setting out of 'job' Bonus standards. • Explain schedule of standard output. • Explain productivity schedule.	• PowerPoint presentation and AV projection equipment • Marker board • Duster • Calculators • Recommended text books	3.1 Demonstrate the general principles of incentive schemes. 3.2 Illustrate the various productivity charts for all works on site	• Guide student to identify various principles of incentives schemes • Show schedule of productivity	• Explain schedule of standard output. • Explain productivity schedule. • List financial and non-financial incentives
GENERAL OBJECTIVE 4		Understand the structural problems in site management and organization.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
13 – 14	4.1 Explain site management 4.2 Explain the principle of organization structuring. 4.3 Explain site management.	• Explain what is management and management hierarchy • Explain the organization structure of small, medium and large Construction companies. • Outline the span of site works Management • Explain what is management and management hierarchy	• PowerPoint presentation and AV projection equipment • Marker board • Duster • Calculators • Recommended text books			• Explain the principle of organization structuring. • Outline the span of site works. • Explain site management.

		• Outline the span of site worksManagement				
GENERAL OBJECTIVE 5		Understand the principles that govern effective communication in public and human relation.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
15	5.1 Explain communication 5.2 Explain the principles that govern effective communication in public and human relation 5.3 Describe how communication affects the individual and group performance.	• Explain what communication is. • Discuss how communication affects individual and group performance. • Discuss industrial relation on typical construction site.	• PowerPoint presentation and AV projection equipment • Marker board • Duster • Calculators • Recommended text books	5.1 Illustrate how communication affects the individual and group performance. 5.2 Illustrate industrial relation on typical construction site	• Show how communication affects individual and group performance.	• Explain how communication affects the individual and group performance.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 222)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **BUILDING CONSTRUCTION IV**

COURSE CODE: **ARC 223**

DURATION: **1 – 2 – 3 – 3**

UNITS: **3 UNITS**

GOAL: This course is designed to provide students with adequate knowledge of external works, building administration and safety precautions as they apply to building site operations.

GENERAL OBJECTIVES: On completion of this module the student will be able to:

1) Understand the needs for External works around the Building.

2) Understand the general administration of Building.

3) Understand various requirements as Regards Fire precautions and regulations as applied to building.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 2 – 3 – 3**
COURSE TITLE	**BUILDING CONSTRUCTION IV**				**COURSE CODE**	**ARC 223**
GOAL	**THIS COURSE IS DESIGNED TO PROVIDE THE STUDENT WITH ADEQUATE KNOWLEDGE OF EXTERNAL WORKS, BUILDING ADMINISTRATION AND SAFETY PRECAUTIONS AS THEY APPLY TO BUILDING SITE OPERATIONS.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Understand the needs for External works around the Building.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 7	1.1 Explain the essence of having external works around a building. 1.2 Explain the essence of having external works around a building. 1.3 Describe the functions of fencing and hedges in building 1.4 List the functions of sewage plants, e.g. septic tank, soakaways, manholes, inspection chambers, sewers etc. 1.5 State the underlying principles in planning a good drainage system	• Explain the essence of having external works around a building. • State the functions of external works. • Explain the functions of fencing and hedges in building • Explain how sewage plants above are constructed.	• PowerPoint presentation and AV projection equipment • Marker board • Duster • Recommended text books	1.1 Illustrate the conditions for providing roads, pathways, and parking lots to buildings. 1.2 State the functions of sewage plants, e.g. septic tank, soakaways, manholes, inspection chambers, sewers etc. 1.3 Reproduce the principles of landscaping to a given site layout including all items of external works. 1.4 Illustrate how sewage plants above are constructed.	• Guide student to illustrate the conditions for providing roads, pathways, and parking lots to buildings. • Show the underlying principles in planning a good drainage system. • Guide student to apply the principles of landscaping to a given site layout including all items of external works.	• List four types of external works around a building. • Sketch a fence, walkway and parking lots around a building in a given site layout. • Give four examples of external works around a building • Give three functions of a fence around a building • List 3 conditions for necessary for the provision of roads, walkways parking lots to a building • Draw a plan and a section of a septic tank and a soakaways pit. • Using the landscape principles of unity, balance, rhythm and repetition landscape a given site layout.
GENERAL OBJECTIVE 2	Understand the general administration of Building.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
8 – 11	2.1 Explain the responsibilities of the various parties involved in the building industry (client, architect, quantity surveyor, builders	• Explain the responsibilities of the various parties involved in the building industry-	• PowerPoint presentation and AV projection equipment • Marker board • Duster			• What are the parties that involved in a building contract? • Describe what a contract is and give 3

	etc.) 2.2 Define contract, different types of contracts, signing and completion of contracts. 2.3 Describe the different types of tendering procedure 2.4 State the methods of site layout and organization, reconstruct planning services on site, safety and security	client, architect, quantity surveyor, builders etc. • Explain contract, different types of contracts, signing and completion of contracts. • Discuss the different types of tendering procedure • Outline the methods of site layout and organization, reconstruct planning services on site, safety and security	• Recommended text books			types of contract • Name 3 types of tendering processes employed in the execution of a building contract • With the aid of a sketch show organization of services and external works on a layout can be used to achieve safety and security.
GENERAL OBJECTIVE 3		Understand various requirements as Regards Fire precautions and regulations as applied to building.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
12 – 15	3.1 List typical risks in buildings to users. 3.2 List fire-fighting equipment in building. 3.3 Describe means of escape and route. 3.4 List fire precautions in building. 3.5 Explain fire resistance materials in building. 3.6 Describe various burglar-proofing materials in buildings.	• Discuss Risk Assessment • Explain the need for means of escape and escape routes • Explain fire precautions in building. • Discuss fire resistance materials in building. • Describe various burglar-proofing materials in buildings.	• Marker board • PowerPoint presentation and AV projection equipment • Duster • Recommended text books	3.1 Fix burglar-proofing materials. 3.2 Demonstrate the use of fire-fighting equipment in building	• Guide student to fix burglar-proofing materials • Guide student to identify fire fighting equipment	• Explain 5 health and safety risks encountered in a building construction site. • Name 3 types of fire -fighting equipment that can be installed in a building. • List 3 examples of fire resistant materials that can be used in a building. • List 3 types of materials used for burglar-proofing in a building

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 223)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **ARCHITECTURAL GRAPHICS III**

COURSE CODE: **ARC 224**

DURATION: **0 – 3– 3 – 3**

UNITS: **3 UNITS**

GOAL: This course is designed to give students the requisite skills in preparing schedules and services drawings.

GENERAL OBJECTIVES: On completion of this module the student will be able to:

1) Understand operating building laws, byelaws and regulations.
2) Understand schedules and specifications.
3) Know the importance of services drawings.
4) Know how to produce Plumbing and Waste Disposal Drawings.
5) Know how to produce electrical installation drawings.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**0 – 3 – 3 – 3**
COURSE TITLE	**ARCHITECTURAL GRAPHICS III**				**COURSE CODE**	**ARC 224**
GOAL	**THIS COURSE IS DESIGNED TO PROVIDE THE STUDENT WITH REQUISITE SKILL IN PREPARING SCHEDULES AND SERVICES DRAWINGS.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Understand operating building laws, bye-laws and regulations.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 2			• Marker board • PowerPoint presentation and AV projection equipment • Duster • Recommended text books	1.1 Illustrate building laws, bye-laws and regulations. 1.2 Illustrate the importance of building laws, bye-laws and regulations. in development control. 1.3 Illustrate the laws and regulations applicable in your area. 1.4 Demonstrate the procedure for obtaining planning approval in your area. 1.5 Prepare documents for purposes of obtaining planning approval.	• Guide the student to prepare documents for purposes of obtaining planning approval in your area.	• Describe the procedure for obtaining planning approval in your area. • Prepare documents for purposes of obtaining planning approval..
GENERAL OBJECTIVE 2	Understand schedules and specifications.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
3 – 5			• Marker board • PowerPoint presentation and AV projection equipment • Duster • Samples of electrical drawings • Recommended text books	2.1 Demonstrate the importance of Services Drawings. 2.2 Carry out schedules specifications 2.3 Show the various types of schedules used in project drawings. 2.4 Prepare the necessary schedules for a given building project. 2.5 Illustrate services drawings. 2.6 Illustrate the importance of Services Drawings 2.7 Illustrate schedules specifications.	• Guide student to carry out 2.2 to 2.5.	• Prepare the necessary schedules for a given building project.

GENERAL OBJECTIVE 3		Know the importance of services drawings.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
6 – 8			• Marker board • PowerPoint presentation and AV projection equipment • Duster • Samples of service drawings • Recommended text books	3.1 Illustrate the various types of services drawings. 3.2 Discover the importance of services drawings amongst working drawings. 3.3 Prepare services layout drawings for a given simple project. 3.4 Draw the water supply system with specification	• Guide student through 3.1 to 3.4	• Prepare services layout drawings for a given simple project. • Draw the water supply system of a simple bungalow
GENERAL OBJECTIVE 4		Know how to produce Plumbing and Waste Disposal Drawings.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
9 – 11			• Marker board • PowerPoint presentation and AV projection equipment • Duster • Samples of service drawings • Recommended text books	4.1 Illustrate Plumbing, drainage and sewage 4.2 Illustrate a typical plumbing network in a given two bedroom bungalow. 4.3 Illustrate the various types of drainage and sewage systems. 4.4 Draw the water supply systems for a given simple project with annotations and specification notes. 4.5 Draw the drainage and waste disposal system for the project in 4.4 above. 4.6 Prepare the sewage disposal drawings for a project. 4.7 Draw a typical plumbing network in a given two-bedroom bungalow.	• .Guide student through activities 4.2 to 4.7	• Draw the drainage and waste disposal system for a given project

GENERAL OBJECTIVE 5		Know how to produce electrical installation drawings.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
12 – 15			• Marker board • PowerPoint presentation and AV projection equipment • Duster • Samples of service drawings • Recommended text books	5.1 Demonstrate Electrical Installation Drawing. 5.2 Illustrate the various types of electrical drawings. 5.3 Illustrate the symbols and conventions used in electrical installation drawings. 5.4 Demonstrate the various types of electrical loads. 5.5 Produce single line diagram for the electrical system of a given simple bungalow. 5.6 Draw the switching circuit and branch circuit details. 5.7 Draw the rising mains and the distribution and service panels. 5.8 Draw the electrical heating and cooling systems in buildings. 5.9 Draw different types of lighting fixtures in buildings. 5.10 Draw the electrical plan of a given simple building. 5.11 Prepare electricity distribution drawings. 5.12 Prepare electricity transmission drawings.	• .Guide student to illustrate the symbols and conventions used in electrical installation drawings. • Guide student through the SLO 5.5 to 5.12	• Draw the electrical plan of a given simple building. • Prepare a simple electricity distribution drawing.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	**PURPOSE AND NATURE OF ASSESSMENT (ARC 224)**	**WEIGHING**
Examination	Final Examination (written) to assess knowledge and understanding	0%
Test	At least 2 progress tests for feedback.	30%
Practical	At least 5 home works to be assessed by the teacher	70%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **MEASUREMENT AND SPECIFICATIONS**

COURSE CODE: **ARC 225**

DURATION: **1 – 1– 2 – 2**

UNITS: **2 UNITS**

GOAL: The course is designed to provide students with the ability to prepare quantities, schedules and bill of quantities.

GENERAL OBJECTIVES: On completion of this module the student should be able to:

1) Understand the purpose of preparing a bill of Quantities using the various methods of processing Dimensions.

2) Know all the different kinds of schedules required in producing a bill of quantities.

3) Know how to write simple specifications to various work sections.

4) Understand the uses of standard method of measurement for building works.

5) Process dimensions, collect quantities and present them for all works sections in traditional elemental and annotated bill forms.

6) Know how to take-off quantities for work involved in a simple domestic building.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 1– 2 – 2**
COURSE TITLE	**MEASUREMENT AND SPECIFICATIONS**				**COURSE CODE**	**ARC 225**
GOAL	**THE COURSE IS DESIGNED TO EQUIP THE STUDENT WITH THE ABILITY TO PREPARE QUANTITIES, SCHEDULES AND BILL OF QUANTITIES.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Understand the purpose of preparing a bill of Quantities using the various methods of processing Dimensions.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 2	1.1 Explain the relevance of bills of Quantities in construction. 1.2 Explain the application of computer in producing a bill of quantities. 1.3 State the item works that are normally covered by the preliminary section of the bill.	• Explain the purpose of preparing bills of quantities for Construction processes. • Discuss a typically computer produced bill of quantities. • List and explain the items of works that are normally covered by the preliminary section of the bill.	• PowerPoint presentation and AV projection equipment. • White board, duster, calculators. • Recommended text books • Computer with relevant software	1.1 Demonstrate the relevance of bills of Quantities Understand the relevance of bills of Quantities. 1.2 Use a computer to producing bill of Quantities 1.3 Illustrate the items of works that are normally covered by the preliminary section of the bill. 1.4 Show a typically computer produced bill of quantities.	• Guide student on the use of computer in producing a bill of quantities. • Guide student to know and write typical preamble clauses of a bill	• Explain the purpose of preparing bills of quantities for Construction processes. • List and explain the items of works that are normally covered by the preliminary section of the bill..
GENERAL OBJECTIVE 2	Know all the different kinds of schedules required in producing a bill of quantities.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
3 – 4	2.1 Describe how to prepare schedules of Doors, windows and finishes. 2.2 State the purposes of the schedule of basic rates	• Discuss how to produce a bill of quantities for doors, windows and finishes • Explain using drawings, bill of quantities and assignments.	• Whiteboard • Drawings, BOQs • PowerPoint presentation and AV projection equipment • Calculators	2.1 Demonstrate using drawings, bill of quantities and assignments. 2.2 Prepare an abstracting sheet using traditional methods. 2.3 Prepare drainage schedules 2.3	• Supervise the students to prepare schedules of doors and windows and finishes • Supervise the students to prepare drainage schedules.	• What are the purposes of the schedule of basic rates • Expalin how to prepare schedules of Doors,.
GENERAL OBJECTIVE 3	Know how to write simple specifications to various work sections.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
5 – 7	3.1 State the purposes and uses of specification. 3.2 State the sources of information for writing specifications. 3.1 Write clear concise and accurate specification of materials and Workmanship 3.3 Write clear, concise and accurate specification of	• Describe a typical specification work. • Explain relevant specification in building works.	• Whiteboard • Drawings, BOQs • PowerPoint presentation and AV projection equipment • Calculators	3.2 Produce a typical specification work. 3.3 Produce a good and accurate specification of materials for workmanship, sand, cement, gravel and concrete 3.4 Demonstrate the purposes and uses of specification 3.5 Produce a good and	• .Guide student how to: - Produce a typical specification work - Produce a good and accurate specifications for materials etc	• Produce a good and accurate specification of materials and workmanship for brickwork, block works, masonry and timber works

	materials and workmanship for Gravel and concrete work. 3.4 3.5 Write clear, concise and accurate specification of materials, and workmanship for Excavation and Earthwork. 3.6 Write clear, concise and accurate specification for materials and workmanship for brickwork, blockwork and masonry 3.7 Write, clear, concise and accurate specification of materials and workmanship for timber woodwork.			accurate specification of materials and workmanship for brickwork, block works, masonry and timber works 3.6 Show a typical specification for workmanship, sand, cement, gravels, concrete, excavation and earthwork. 3.7 Show a typical specification for materials and workmanship for brickwork, block works, masonry and timber works.		
GENERAL OBJECTIVE 4		Understand the uses of standard method of measurement for building works.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
8 – 9	4.1 Explain the Historical background of SMM. 4.2 Identify various works section and their unit of measurement. 4.3 Explain the standard method of measurement of building works. 4.4 Explain where and when to use the various unit of measurement.	• Explain the historical background of SMM and the various work section and their unit of measurement. • Explain the standard method of measurement of building works and know where it should be used.	• White board, Drawings, • BOQ, SMM, • PowerPoint presentation and AV projection equipment. • Calculators	4.1 Illustrate the Historical background of SMM. 4.2 Identify various works section and their unit of measurement. 4.3 Show the standard method of measurement of building works 4.4 Illustrate where and when to use the various units of measurement.	• Guide student to to use SMM	• . Explain the standard method of measurement of building works • What is the meaning of SMM
GENERAL OBJECTIVE 5		Process dimensions, collect quantities and present them for all works sections in traditional elemental and annotated bill forms.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
10 – 11	5.1 State the method of booking dimensions and be able to use them where and when necessary.. 5.2 Explain the difference between taking-off, abstracting, direct billing, cut and shuffle and billing sheet.	• Explain method of booking dimensions and make student use them where and when necessary. • Discuss how to process dimensions, collecting quantities and presenting them	• White board, Drawings, • BOQ, SMM, • PowerPoint presentation and AV projection equipment. • Calculators	5.1 Practice the method of booking dimensions and use them where and when necessary. 5.2 Prepare an abstracting sheet using traditional methods 5.3 Carry out taking-off, abstracting, direct billing,	• Guide student on how to prepare an abstracting sheet using traditional methods • Guide student to use drawing and models to differentiate between taking-off,	• Explain the primary purpose and other uses of the Bill of Quantities. • Distinguish between bill formats-traditional, elemental & operational.

	5.3 State the various methods of bills of quantities. 5.4 Explain the primary purpose and other uses of the Bill of Quantities. 5.5 Distinguish between the bill formats - traditional, elemental and operational	for all works sections in traditional elemental and annotated bill forms • Explain the difference between taking-off, abstracting, direct billing, cut and shuffle and billing sheet.		cut and shuffle and billing sheet.	abstracting, direct billing, cut and shuffle and billing sheet	
GENERAL OBJECTIVE 6		Know how to take-off quantities for work involved in a simple domestic building.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
12 – 15	6.1 Explain take off quantities for simple substructure works. 6.2 Explain take off quantities for simple wall construction 6.3 Explain take off quantities for sub-structural work including undulating sloping sites, stepped foundation and basements. 6.4 Explain take off quantities for simple wall construction in super structure. 6.5 Explain take off quantities for all kinds of floor construction. 6.6 Explain take -off quantities for simple roof construction and coverings. 6.7 Explain take-off quantities for doors and windows including adjustment to form. 6.8 Explain take-off quantities for building works for simple re-enforced concrete framework. 6.9 Explain take-off quantities for building works for simple steel framing and	• Describe in details processes of take-off quantities for simple substructure. • Explain how to take off Quantities for simple wall construction in super structure, for all kinds of floor construction and for simple roof construction and coverings. • Explain how to take off BOQs of building works for simple steel framing and trusses, staircases in timber and concrete and for simple drainage work.	• White board, Drawings, • BOQ, SMM, • PowerPoint presentation and AV projection equipment. • Calculators	6.1 Take off quantities for simple substructure works, simple wall construction and sub-structural work including undulating sloping sites, stepped foundation and basements. 6.2 Take off Quantities for simple wall construction in super structure, for all kinds of floor construction and for simple roof construction and coverings. 6.3 Produce BOQs for doors, windows including adjustment to form, for building works & for simple re-enforced concrete framework. 6.4 Produce BOQs of building works for simple steel framing and trusses, staircases in timber and concrete and for simple drainage work and	• Guide student how to take off items listed in 6.1 to 6.4.	• Take off Quantities for simple wall construction in super structure, for all kinds of floor construction and for simple roof construction and coverings. • Produce BOQs for doors, windows including adjustment to form, for building works & for simple re-enforced concrete framework.

	trusses. 6.10 Explain take off quantities for building works for staircases in timber and concrete. 6.11 Explain take-off quantities for building works for simple drainage work.					

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 225)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **COMPUTER AIDED DESIGN AND DRAFTING – 3D**

COURSE CODE: **ARC 226**

DURATION: **0 – 3 – 3 – 3**

UNITS: **3 UNITS**

GOAL: The course is designed to acquaint students with knowledge and skills of modelling a propose design using AutoCAD 3D environment.

GENERAL OBJECTIVES: On completion of this module the student will be able to:

1) Understand the basic tools used in 3D environment.
2) Build simple solid objects and extrude basic elements in 2D and 3D environments.
3) Produce simple 3D architectural model.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**0 – 3 – 3 – 3**
COURSE TITLE	**COMPUTER AIDED DESIGN AND DRAFTING – 3D**				**COURSE CODE**	**ARC 226**
GOAL	**TO GAIN WORKING KNOWLEDGE AND SKILLS ON MODELLING A PROPOSE DESIGN USING AUTOCAD 3D ENVIRONMENT.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Understandthe basic tools used in 3D environment.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 2			• White board • Computer linked with interactive board • Computer systems • Relevant textbooks • Overhead projectors • exemplars	1.1 Demonstrate Interchanging from 2D environment to 3D. 1.2 Select the necessary tools and menus bars in the 3D environment. 1.3 Assign 3D- form for each object modelled used in 3D AutoCAD environment for the Name and colour. 1.4 Introduce3D tools to the student.	• Guide student to interchange between 2D and 3D environment. • Guide student to select the necessary tools and menus bar in the 3D environment	• List 5 necessary tools and menus bars in the 3D environment
GENERAL OBJECTIVE 2	Build simple solid objects and extrude basic elements in 2D and 3D environments.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
3 – 9			• White board • Computer linked with interactive board • Computer systems • Relevant textbooks • Overhead projectors • exemplars	2.1 Illustrate the principle of modelling in 3D environment. 2.2 Model of simple 3D forms from 2D drawings. 2.3 Use solid edit tool bar in editing 3D objects. 2.4 Extrude 2D object to 3D form in a given dimension. 2.5 Extrude 2D doors and window to 3D form in a given dimension fixing into opening space. 2.6 Illustrate Subtraction, Union and intersection of 3D objects and other 3D solid edit tools.	• Guide student to model of simple 3D forms from 2D drawings. • Guide student through 2.2 to 2.6	• Produce a 3D model from a simple 2D drawing. • Extrude 2D doors and window to 3D form in a given dimension fixing into opening space.
GENERAL OBJECTIVE 3	Produce simple 3D architectural model.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**

10 – 15			• White board • Computer linked with interactive board • Computer systems • Relevant textbooks • Overhead projectors • exemplars	3.1 Identify the 3D navigation tools and families. 3.2 Modify objects in 3D environment. 3.3 Model roof in 3D environment generating it from 2D environment. 3.4 Model external work feature from site-layout.	• Guide student to model roof in 3D environment generating it from 2D environment. • Guide student to produce external work from site-layout.	• Model a roof in 3D environment • Produce external work from site-layout.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 226)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	0%
Test	At least 2 progress tests for feedback.	30%
Practical	At least 5 home works to be assessed by the teacher	70%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **MAINTENANCE TECHNOLOGY**

COURSE CODE: **ARC 227**

DURATION: **1 – 1 – 2 – 2**

UNITS: **2 UNITS**

GOAL: This course is intended to provide students with Knowledge of the basic principles and understanding of building maintenance and repairs.

GENERAL OBJECTIVES: On completion of this module the trainee will be able to:

1) Understand the meaning of the terms used in maintenance, repairs and related facilities.
2) Understand the ground geological fault and their effect on building.
3) Understand the types of defects which affect brick, blockworks and masonry and remedies for them.
4) Understand the causes of defect and their remedies in low-rise buildings.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**1 – 1 – 2 – 2**
COURSE TITLE	**MAINTENANCE TECHNOLOGY**				**COURSE CODE**	**ARC 227**
GOAL	**THIS COURSE IS INTENDED TO PROVIDE THE STUDENT WITH KNOWLEDGE OF THE BASIC PRINCIPLES AND UNDERSTANDING OF BUILDING MAINTENANCE AND REPAIRS.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Understand the meaning of the terms used in maintenance, repairs and related facilities.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 3	1.1 Explain building maintenance 1.2 Define the terms used in the practice of repairs and maintenance of building and related facilities. 1.3 Explain the various terms used in building maintenance	• Explain the meaning of maintenance generally. • Explain the meaning of building maintenance • Explain the terms used in building maintenance and related facilities.	• PowerPoint presentation and AV projection equipment. • Marker board • Calculators • Recommended text books	.		• Explain five terms used in the practice of repairs and maintenance of buildings.
GENERAL OBJECTIVE 2	Understand the ground geological fault and their effect on building.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
4 – 6	2.1 Explain the geological faults, which cause defect in the foundation of building. 2.2 State the effect of foundation failures on the walls of buildings. 2.3 Explain the effect of foundation failures on the walls of building. 2.4 Describe the remedies to various foundation failures. 2.5 Explain how such faults cause defects in foundation of building.	• Explain faults generally. • Explain the geological faults which cause defect in the foundation of building. • State the effect of foundation failures on the walls of buildings • Describe the remedies to various foundation failures • Describe the ground faults and the remedies to foundations. • Explain how these faults can be remedied.	• PowerPoint presentation and AV projection equipment. • Marker board • Calculators • Recommended text books	2.1 Identify the geological faults, which cause defects in the foundation of buildings. 2.2 Identify the effects of foundation failures on the walls of buildings. 2.3 Illustrate the ground faults and the remedies to foundations 2.4 Identify the effect of foundation failures on the walls of building. 2.5 Show how such faults cause defects in foundation of building. 2.6 Describe the remedies to various foundation failures	• Organize site visit to enable student: - Identify foundation failure on the walls of a building - Identify the effects	• List two effects of foundation failures on the walls of buildings.
GENERAL OBJECTIVE 3	Understand the types of defects which affect brick, blockworks and masonry and remedies for them.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
7 – 9	3.1 List the types of defects in brick, sandcrete wall, block wall, sand masonry walls and timber.	• Explain the various defects in walls. • Explain remedies for decay in walls and	• PowerPoint presentation and AV projection equipment.	3.1 Illustrate the types of defects in block works, sandcrete/concrete walls, masonry wall and timber	• Take student to site to appreciate 3.1 to 3.3	• Give examples of such defects question/answers of decay in wall and

	3.2 Explain the causes of decay in block-wall, sandcrete wall, masonry wall and timber. 3.3 List the remedies for decay in walls and timber.	timber. • List the remedies for decay in walls and timber.	• Marker board • Calculators • Recommended text books	walls. 3.2 Identify the causes of decay in block work and sandcrete/concrete wall, masonry wall and timber walls 3.3 Illustrate the remedies for the above decay		timber. • List the remedies for decay in walls and timber
GENERAL OBJECTIVE 4		Understand the causes of defect and their remedies in low-rise buildings.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
10 – 15	4.1 Identify the types of defects in roofs. 4.2 Explain simple methods of prevention and remedies for 4.1 above. 4.3 Explain the causes and effects of rising damp and penetrating damp on structure and fabric e.g. walls, floors, roofs etc. 4.4 List the effect of technology on maintenance	• Explain the causes of defects in roofs. • Predict simple methods of remedying the defects in low rise building. • Explain the causes and effects of rising damp and penetrating damp on structure and fabric e.g. walls, floors, roofs etc. • Explain the effect of technology on maintenance •	• PowerPoint presentation and AV projection equipment. • Marker board • Calculators • Recommended text books	4.1 Practice simple of prevention and remedies for roof defects. 4.2 Demonstrate simple methods of remedying the defects in low rise .. 4.3 Show simple methods of prevention and remedies	• Guide student to identify defects in roof and low rise building and how to remedying the defects.	• State five types of defects in roofs. • Explain the causes and effects of rising damp and penetrating damp on walls. • Propose simple methods of prevention and remedies

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 227)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

PROGRAMME: **NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**

COURSE TITLE: **BASICS OF CLIMATOLOGY**

COURSE CODE: **ARC 228**

DURATION: **2 – 0 – 2 – 2**

UNITS: **2 UNITS**

GOAL: This course is designed to create awareness of the climate and its effects on buildings and the environment.

GENERAL OBJECTIVES: On completion of this module the student will be able to:

1) Understand the various climatic elements affecting buildings and the built environment.
2) Understand the proper orientation of buildings in respect of wind/rain and solar radiation.
3) Understand the various devices for eliminating unwanted weather conditions.
4) Understand the microclimate effects of a particular site on buildings.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**				**CONTACT HOURS**	**2 – 0 – 2 – 2**
COURSE TITLE	**BASICS OF CLIMATOLOGY**				**COURSE CODE**	**ARC 228**
GOAL	**THIS COURSE IS INTENDED TO CREATE AWARENESS OF THE CLIMATE AND ITS EFFECTS ON BUILDINGS AND THE ENVIRONMENT.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Understand the various climatic elements affecting buildings and the built environment.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 – 4	1.1 Explain Elimatic Elements Affecting Buildings. 1.2 Explain the effect of moisture such as rain, frost, fog and vapour pressure on buildings. 1.3 List the effect of temperature on buildings. 1.4 State the effect of wind on buildings 1.5 List the effect of solar radiation on buildings and its occupants giving building openings accordingly.	• Explain climatic Elements Affecting Buildings. • Explain the effect of moisture such as rain, frost, fog and vapour pressure on buildings. • Explain the effect of temperature, wind and solar radiation on buildings and the occupants. • Discuss the effect of solar radiation on buildings and its occupants giving building openings accordingly.	• PowerPoint presentation and AV projection equipment. • Marker board • Maps and weather charts • Recommended text books			• List 5 climatic elements that affect buildings and the built environment. • Mention 3 ways in which temperature affect buildings • List 3 building elements that are most affected by wind • Describe how windows, doors and skylights assist in the transmission of solar radiation into buildings
GENERAL OBJECTIVE 2	Understand the proper orientation of buildings in respect of wind/rain and solar radiation.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
5-6	2.1 Identify the direction of the sun and its intensity. 2.2 Describe the orientation of buildings to eliminate excessive solar radiation.	• Explain the direction of the sun and its intensity. • Discuss the orientation of buildings to eliminate excessive solar radiation.	• PowerPoint presentation and AV projection equipment. • Marker board • Maps and weather charts • Relevant text books			• Using the direction of the sun and a sketch, orientate a building to increase energy efficiency and maximum comfort to its occupants.
GENERAL OBJECTIVE 3	Understand the various devices for eliminating unwanted weather conditions.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
7 – 10	3.1 Enumerate the various types of unwanted weather conditions. 3.2 Choose suitable building elements to achieve 3.1 above.	• Describe the various types of unwanted weather conditions. • Explain simple and suitable shading	• PowerPoint presentation and AV projection equipment. • Marker board			• Name 5 types of unwanted weather condition and their effect on buildings. • List 3 building

	3.3 Choose simple and suitable shading devices to eliminate direct solar radiation and the effect of driving rain	devices to eliminate direct solar radiation and the effect of driving rain.	• Maps and weather charts • Relevant text books			elements used in eliminating unwanted weather conditions into buildings • Using sketches explain how aluminium louvers and window blinds can be used to control the effect of solar radiation and driving rain in buildings.
GENERAL OBJECTIVE 4		Understand the micro-climate effects of a particular site on buildings.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
11 – 15	4.1 Explain the effect of a hill on the climate of the surroundings. 4.2 Explain the effect of a large body of water on the climate of the surroundings. 4.3 Explain the effect of built-up surroundings on climate. 4.4 Explain the effect of the different climatic zones on buildings.	• Explain the effect of a hill on the climate of the surroundings. • Explain the effect of a large body of water on the climate of the surroundings • Explain the effect of a large body of water on the climate of the surroundings. • Explain the effect of the different climatic zones on buildings.	• PowerPoint presentation and AV projection equipment. • Marker board • Maps and weather charts • Relevant text books			• Describe the leeward and windward of a hill and their effect on the surrounding climate • Describe how a large body of water affects the climate of a surrounding in both raining and dry seasons. • Describe how the height of buildings (high rise) affects wind movement. • Describe the design criteria to be used in the design of buildings for: - Coastal Zone - Forest Zone - Savannah Zone

ASSESSMENT

TYPE OF ASSESSMENT	PURPOSE AND NATURE OF ASSESSMENT (ARC 228)	WEIGHING
Examination	Final Examination (written) to assess knowledge and understanding	20%
Test	At least 2 progress tests for feedback.	20%
Practical	At least 5 home works to be assessed by the teacher	60%
TOTAL WEIGHT		**100**

STRUCTURE

PROGRAMME:	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**
COURSE TITLE:	**WORKSHOP PRACTICE IV**
COURSE CODE:	**BLD 206**
DURATION:	**0 – 3 – 3 – 3**
UNITS:	**3 UNITS**
GOAL:	This course is designed to acquaint students with basic skills and knowledge of electrical wiring.
GENERAL OBJECTIVES:	On completion of this module the trainee will be able to: 1) Understand Electrical Installation Involved in the building process. 2) Know the construction of a small model Building complete with all essential services and finishes.

PROGRAMME	**NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY**			**CONTACT HOURS**		**0 – 3 – 3**
COURSE TITLE	**WORKSHOP PRACTICE IV**			**COURSE CODE**		**BLD 206**
GOAL	**THIS COURSE IS INTENDED TO EQUIP THE STUDENT WITH BASIC SKILLS IN ELECTRICAL WIRING.**					
	THEORETICAL CONTENT			**PRACTICAL CONTENT**		
GENERAL OBJECTIVE 1	Understand Electrical Installation Involved in the building process.					
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
1 -6			• Relevant Workshop consumables (cement, sand, trowels, line,spirit level etc.) • Fully equipped Electrical Installation Workshop • Marker board	1.1 Illustrate the safety precautions required in workshops and site. 1.2 Identify the electrical symbols and regulations with special reference to I.E.E. Regulations. 1.3 Select different types of generators used on site with emphasis on portable generators. 1.4 Select types of cables and where they are used. 1.5 Identify cable colours and regulations applicable. 1.6 Select the types of conduits for practical wiring. 1.7 Apply regulations applicable to earthling systems.	• Guide student how to observe safety precautions required in workshops and site e.g. how human body can become part of electric circuit and remedy; severe shock and artificial respirations. • Show student how to identify electrical symbols and regulations with special reference to I.E.E. Regulations. • Guide student to select and Identify tools, equipment and accessories used in simple electrical works and their maintenance requirements. • .Guide student to select types of generators used on site with emphasis on portable generators and electrical power distribution systems, e.g. I and 4 wire system for both A.C. & D.C.	• List the types of conduits for practical wiring. • Identify the electrical symbols and regulations with special reference to I.E.E. Regulations.

GENERAL OBJECTIVE 2		Know the construction of a small model Building complete with all essential services and finishes.				
Week	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Evaluation**
7 – 15			• Workshop consumables (cement, sand, trowels, line, spirit level etc. • Marker board • Relevant textbooks	2.1 Select basic instruments used for setting out. 2.2 Set out the first course of walling for door opening. 2.3 Construct wall to window level. 2.4 Set out the various windows and their openings 2.5 Reproduce a wall up to roof level 2.6 Fix window and door frames 2.7 Fix pipes for plumbing and electrical works 2.8 Carry out ceiling construction 2.9 Plaster walls internally and externally 2.10 Fix wall and floor tiles as required 2.11 Equip students with basic skills in electrical wiring.	• Organize site visit to assist student in carrying out activities 2.1 to 2.11	• Set out the first course of walling for door opening. • Plaster walls internally and externally.

ASSESSMENT STRUCTURE

TYPE OF ASSESSMENT	**PURPOSE AND NATURE OF ASSESSMENT (BLD206)**	**WEIGHING**
Examination	Final Examination (written) to assess knowledge and understanding	0%
Test	At least 2 progress tests for feedback.	30%
Practical	At least 5 home works to be assessed by the teacher	70%
TOTAL WEIGHT		**100**

LIST OF PHYSICAL FACILITIES FOR A CLASS SIZE OF ONE STREAM (30 STUDENTS ONLY)

Programmes	Laboratories	Workshops	Others
National Diploma	1) Materials Science Laboratory 2) Soil Mechanics Laboratory 3) Structures/Strength of Materials	1) Block laying & Concrete Workshop 2) Carpentry & Wood Workshop 3) Electrical Installation Workshop 4) Painting Decoration & Glazing Workshop 5) Plumbing/Mechanical Workshop	1) Architectural Drawing Studio 2) Photographic Studio 3) Surveying Equipment Store 4) Modeling Studio 5) Architectural equipment & Material Store 6) Computer Studio 7) Lecture Room 8) Seminar/Jury Room
Higher National Diploma	1) Structures/Strength of Materials	1) Electrical Installation Workshop	1) Architectural Drawing Studio 2) Modeling Studio 3) Architectural equipment & Material Store 4) Computer Studio 5) Lecture Room 6) Seminar/Jury Room

LIST OF TOOLS AND EQUIPMENT IN MATERIAL SCIENCE LABORATORY

s/n	Equipment/Tool	No Required
1.	Moisture content test apparatus	6
2.	Specific gravity test apparatus	10
3.	Density test apparatus	10
4.	Permeability test apparatus	5
5.	Cement fitness test apparatus	2
6.	Vicat apparatus	1
7.	Drying oven	3
8.	Sample collecting trays	10
9.	150mm cube moulds	18
10.	150mm cylindrical moulds	18
11.	Balances	2
12.	Measuring cylinders	5
13.	Curing tank	1
14.	Stop watches	10
15.	Crushing machine	1
16.	Chalkboard	1

LIST OF TOOLS AND EQUIPMENT IN SOIL MECHANICS LABORATORY

s/n	Equipment/Tool	No Required
1.	Consistency limit test apparatus	10
2.	Compacting core machine	1
3.	Compacting factor testing machine	1
4.	Portable size distribution test apparatus	5
5.	Compacting test apparatus	1
6.	Cone penetrometer	1
7.	Moisture content test apparatus	6
8.	Specific gravity test apparatus	10
9.	Density test apparatus	10
10.	Le chateller test apparatus	5
11.	V-B Consistometer test apparatus	1
12.	Drying Ovens	3
13.	Sample collecting trays and sample containers	10
14.	150mm cube moulds	30
15.	150mm cylindrical moulds	30
16.	Balances	2 of each
17.	Vicat apparatus	2
18.	Thermometer	5 of each
19.	Cement fineness test apparatus	2
20.	Measuring cylinders	5
21.	Soil hydrometer	5
22.	Crucibles, spatulas, filter, paper funnel and Verniercalliper	Assorted
23.	Desiccators	6
24.	Curing tank	1
25.	Stop watches	10
26.	Beam moulds	4
27.	Crushing Machine	1
28.	Chalkboard	1

LIST OF TOOLS AND EQUIPMENT IN STRUCTURES LABORATORY

s/n	Equipment/Tool	No Required
1.	Two-hinged arch apparatus	1
2.	Continuous beam apparatus	1
3.	Deflection of beams apparatus	1
4.	Bending moment and shear force apparatus	1
5.	Elastic beam apparatus	1
6.	Elastic deflection of frames	1
7.	Struts buckling apparatus	1
8.	Plastic bending of portal frames	1
9.	Perfect or redundant trusses apparatus	1

LIST OF TOOLS AND EQUIPMENT IN BLOCKLAYING AND CONCRETE WORKSHOP

s/n	Equipment/Tool	No Required
1.	Bar bending machine	1
2.	steel cutter	1
3.	Mesh/BRC cutter	1
4.	Tyrolean machine	1
5.	Concrete vibrators: poker and table vibrators	1 set
6.	Hand hammers	4 sets
7.	Portable concrete mixer (at least 2cu. ft. capacity)	1
8.	Brick/Block-making machine	1
9.	Wheel barrow	5
10.	Watering can	5
11.	Shovels	30
12.	Head pans	10
13.	Terrazzo polishing machine	1
14.	Brick saw	1
15.	Concrete nail gun	1
16.	Cement box	5
17.	Aggregates and sand box	5
18.	Slump cones	2
19.	Cube testing machine	1
20.	Hand tools, eg. spirit level, towels, hammers, rules, squares, mallets, tapes, floats, etc.	

LIST OF TOOLS AND EQUIPMENT IN CARPENTRY AND WOOD WORKSHOP

s/n	Equipment/Tool	No Required
PLANES AND SAWS		
1.	Jack planes	6
2.	Smoothing planes	6
3.	Block planes	6
4.	Shoulder planes	6
5.	Rebate planes	6
6.	Grooving/Plough planes	6
7.	Bull nose planes	6
8.	Jointing planes	6
9.	Rip saws	6
10.	Cross cut/hand saws	6
11.	Tenon saws	6
CHISELS		
12.	Ordinary firmer (set-3mm, 6mm, 12mm, 18mm and 25mm)	6 sets
13.	Bevel-edge firmer (set-3mm, 6mm, 12mm, 18mm and 25mm)	6 sets
14.	Mortice (set-6mm, 9mm and 12mm)	6 sets
BITS		
15.	Centre	5 sets
16.	Auger	5 sets
17.	Twist	5 sets
18.	Counter-sink	5 sets
19.	Rose	5 sets
20.	Gimlet	5 sets
DRIVING/STRIKING TOOLS		
21.	Screw drivers (set of 6)	10 sets
22.	Mallet	6
23.	Claw hammer	6
24.	Plane hammer	6

s/n	Equipment/Tool	No Required
CRAMPS		
25.	Sash	6 sets
26.	Gee ("G") cramp	6
27.	Corner	6
28.	Bench-hold fast	6
GAUGES, KNIVES, ETC		
29.	Marking gauges	5
30.	Mortice gauge	5
31.	Combined gauge	5
32.	Cutting gauge	5
33.	Marking knives	5
34.	Vernier Knives	5
35.	Try square	5
36.	Metre square	5
37.	Four-fold wooden ruler metric	5
38.	Metric measuring tapes (6m)	5
POWERED HAND TOOLS		
39.	Circular saw	4
40.	Drills	4
41.	Disc sander	4
42.	Jig saw	4
43.	Blower	4
44.	Sprayer	4
45.	Grinding machines	2
46.	Sharpening machines	2
47.	Grinding stones	5
48.	Grinder for long blades, eg. surface plane	1
49.	Glue spreader	30
50.	Glue heater (electric)	2

LIST OF TOOLS AND EQUIPMENT IN CARPENTRY AND WOOD WORKSHOP (Continued)

s/n	Equipment/Tool	No Required
MACHINES		
51.	Circular sawing machine	1
52.	Surfacer	1
53.	Spindle moulder	1
54.	Mortiser (chisel and chain)	1
55.	Drilling machine	1
MISCELLANEOUS		
56.	Triangular files	6 sets
57.	Flat files	6 sets
58.	Scrapers (flat)	6 sets
59.	Scrapers (cabinet)	6 sets
60.	Dividers	6 sets
61.	Round files	6 sets
62.	Spoke shaves	6 sets
63.	Wood-workers pencils	40
64.	Saw vices	5
65.	Oil cans	5
66.	Bench stop (metal type)	5
67.	Paint brushes	10 sets
68.	Paint containers	10
69.	Putty knives	10
70.	Glue brushes	10
71.	Glue pots	30
UTILITIES		
72.	Work benches	16
73.	Hangers for dresses	32
74.	Display board	2
75.	Chalkboard	1

LIST OF TOOLS AND EQUIPMENT IN ELECTRICAL INSTALLATION WORKSHOP

s/n	Equipment/Tool	No Required
1.	Bending vices/machine	10
2.	Electrician tool kits	4
3.	Soldering iron and equipment	10
4.	Avometers	2
5.	Ammeters	2
6.	Voltmeters	2
7.	Ohmmeters	2
8.	Wiring boards	6
9.	Consumer units	
	a) Circuit breakers	Assorted
	b) Distribution box	5
	c) Outlets, plugs and switches	Assorted
	d) Meters	5
	e) Mains switch	Assorted

LIST OF TOOLS AND EQUIPMENT IN PAINTING, DECORATION AND GLAZING WORKSHOP

s/n	Equipment/Tool	No Required
1.	Spraying machine	2
2.	Paint rollers	6
3.	Diamond/Glass cutter	2
4.	Paint kettle and hook	2
5.	Bucket	10
6.	Tray	10
7.	Sanders	6
8.	Wire brush	6
9.	Descaling chisels	5
10.	Needle gun	2
11.	Gas torch	1
12.	Brushes	10
13.	Paint pad	2
14.	Paint mitten	10
15.	Assorted hand tools, eg, knives, hooks, stirrer, hammers, pincers, punch, straight edge, screw driver, wire brushes, trowels, chisels, strainers, filing board and hawk, rubbing block, etc.	

LIST OF TOOLS AND EQUIPMENT IN PLUMBING WORKSHOP

s/n	Equipment/Tool	No Required
1.	Guillotine	1
2.	Fittings	Assorted
3.	Pumps (various types, e.g. centrifugal, submersible, etc.)	1 each
4.	Valves, surge tanks, water hose	Assorted
5.	Pipe bending machine	1
6.	Light duty drilling machine	1
7.	Heavy duty drilling machine	1
8.	Table drilling machine	1
9.	Sheet metal folding machine	1
10.	Tapping machine	1
11.	Forge	1
12.	Arc-welding machine	1
13.	Oxy-acetylene welding equipment	1
14.	Acetylene generator	1
15.	Electric soldering tool	1
16.	Refixhydraulic pipe bender	1
17.	Grinding machine	1
18.	Jack pump	6
19.	Pipe standing vices	6
20.	Table vices	15
21.	Copper bits	1
22.	Copper tube bender	1
23.	Hack saw	1
24.	Shave hooks	10
25.	Box wood bending dresser	1
26.	Tin snips	6
27.	Hacking knife	6
28.	Wrench	Assorted
29.	Dices	Assorted

LIST OF TOOLS AND EQUIPMENT IN ARCHITECTURAL DRAWING STUDIO

s/n	Equipment/Tool	No Required
1.	A1 size drawing boards with stools	30 sets
2.	Rapidographs (sets of 8 pens)	5 sets
3.	Graphos pens	5 sets
4.	Pantographs	2
5.	Adjustable set squares (assorted of 3 sizes)	5 sets
6.	Pencil sharpening machines	10
7.	Architects, metric scales	10
8.	Drawing instruments	5 sets
9.	Leroy lettering sets	5 sets
10.	French curves (assorted of 3 types)	10 sets
11.	Stanocinpt lettering sets	10 sets
12.	Display boards (30 square metres)	1
13.	steel/Wood filing cabinet (for drawings of A0 sizes)	6
14.	Tee squares (A1 size)	64
15.	Light tables	2
16.	Lettering stencils and templates	10 sets

LIST OF TOOLS AND EQUIPMENT IN PHOTOGRAPHIC STUDIO

s/n	Equipment/Tool	No Required
1.	35mm camera	10
2.	Lenses (Zoom and wide angle)	5 sets
3.	Custom bellows attachment	2
4.	Enlargers	2
5.	Adjustable printing frame	2
6.	Plastic trays	6
7.	Metal dishes	6
8.	Measuring beakers	4
9.	Trimmer	1
10.	Clock timer	3
11.	Copy stand	1
12.	Plastic development stand	4
13.	Electric dryer	1
14.	Power exposure meter	2
15.	Brawn electronic flash-gun	2
16.	Forceps	6
17.	Grip clamps	3
18.	Ultra-violet light developer	1
19.	Laminations machine.	1

LIST OF TOOLS AND EQUIPMENT IN SURVEY EQUIPMENT STORE

s/n	Equipment/Tool	No Required
1.	Automatic Level with Levelling Staff	6
2.	Sokkia BT29 Window A&B	4
3.	Digital Staff	2
4.	Telescopic Staff	5
5.	Wild T3/T2/T1	6
6.	Wild (DI 4L) EDM	1
7.	Theodolite with Tripod (Analog & Digital)	6
8.	Compasses	5
9.	Tripods	12
10.	Staves	10
11.	Ranging poles	20
12.	Surveying umbrella	5
13.	Chains (30 metres)	10
14.	Steel arrows	45
15.	Measuring tapes (30m, 50m and 100m)	10 each
16.	Steel band (50m/30/100m)/	5 each
17.	Linen Tape (50m/30m)	5 each
18.	Hand Held GPS	2
19.	Hand Held Compass	2
20.	Metal Shoe Jungle Booth	30
21.	Tilting Level	1
22.	Total Station with Accessories	4
23.	Promark 3 RTK	1
24.	Wooden Staff (Long)	1
25.	Compass Head	2
26.	Compass Stand (Long)	7
27.	Compass Stand (Short)	10
28.		

LIST OF TOOLS AND EQUIPMENT IN MODELING STUDIO

s/n	Equipment/Tool	No Required
1.	Sanders	10
2.	Planes	10
3.	Drill press	6
4.	Band saw	3
5.	Radial saw	3
6.	Circular saw	3
7.	Chisels (assorted)	10 sets
8.	Files (assorted)	10 sets
9.	Hammers (assorted)	10 sets
10.	Mallets	10 sets
11.	Cutters (varieties)	5 sets
12.	Benders	10 sets
13.	Folders	10 sets
14.	Scribbers	10 sets
15.	Hacksaw with blades	10 sets
16.	Punches	10 sets
17.	Spraying guns (manual and electrical)	5 sets

s/n	Equipment/Tool	No Required
18.	Sanders	10
19.	Hacksaw frames	5 sets
20.	Drills	6 sets
21.	Grinders (manual and electrical) with grinding stones	3 sets
22.	Hand vices	10 sets
23.	Rubber gloves	32 sets
24.	Tool box	3 sets
25.	Jig saws	10 sets
26.	Soldering iron	3 sets
27.	Screw drivers	6 sets
28.	Try square	4 sets
29.	Pliers	6 sets
30.	Glue pot	3 sets
31.	Pincers	10 sets
32.	Brushes	32 sets
33.	Chalkboard	1
34.	Work benches	

LIST OF TOOLS AND EQUIPMENT IN ARCHITECTURAL EQUIPMENT AND MATERIAL STORE

s/n	Equipment/Tool	No Required
1.	42 inch trimming machine	2
2.	Large stapling machine with staple pins	3
3.	Hand tally counter	5
4.	Blue print equipment	2
5.	Duplicating machine	1
6.	Photocopying machine	1
7.	Slide projector with slides	1
8.	Electronic scanning machine	1
9.	Film projector or video machine and screen with films	1
10.	Overhead transparency projectors	1
11.	Projection screens	2
12.	Tape recorders	1
13.	Typewriters (electric/manual)	2
14.	steel filing cabinets (for files)	4
15.	Office stationeries/consumables	Assorted

LIST OF TOOLS AND EQUIPMENT IN COMPUTER STUDIO

s/n	Equipment/Tool	No Required
1.	Desktop computers with mouse, keyboard and other accessories	30
2.	Computer table	30
3.	Electricity Stabilizer	2
4.	Marker board	1
5.	UPS unit for each computer	30
6.	A1 Size printers	1
7.	Projector screen	1
8.	Multi-socket Extension cables	15

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