UGANDA BUSINESS AND TECHNICAL EXAMINATIONS BOARD

MODULAR ASSESSMENT SYLLABUS FOR NATIONAL CERTIFICATE IN WOODWORK TECHNOLOGY (NCWT)

March 2022

1.0 PREAMBLE

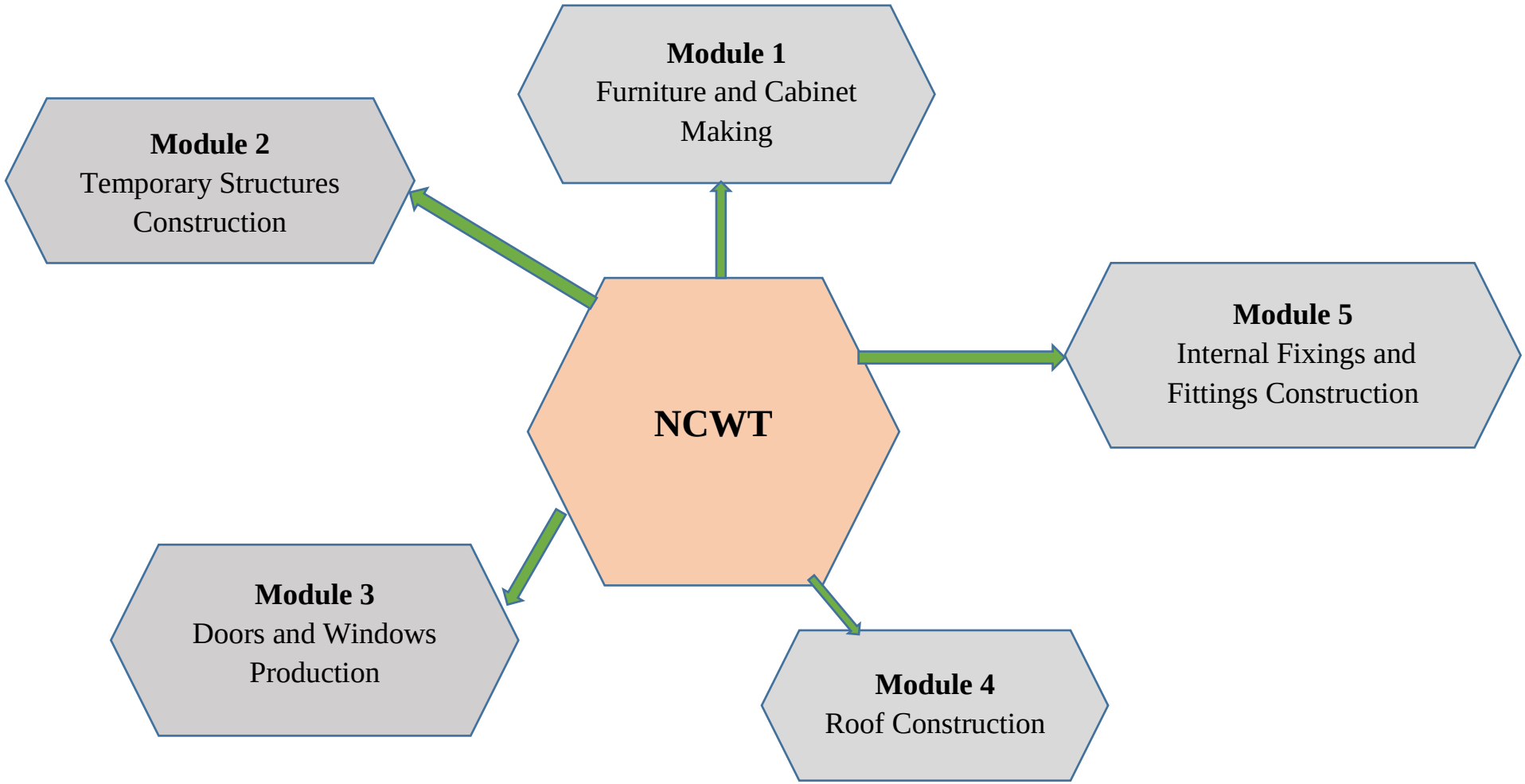
The Ministry of Education and Sports is spearheading modularization of assessment as part of the implementation of the Technical and Vocational Education Training (TVET) policy, 2019 reforms.

This Modular Assessment Syllabus (MAS) has been derived from the NCDC curriculum of National Certificate in Woodwork Technology (2016) which is currently being taught and assessed for trainees.

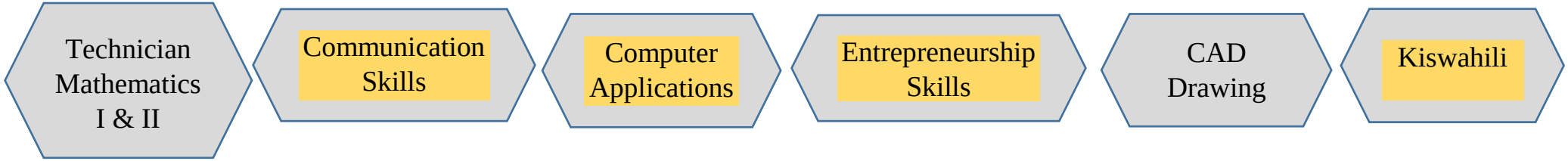
The syllabus looked at related content in the curriculum and realigned it into eight (7) modules of; Furniture and cabinet making, Doors and windows production, Temporary structures construction, Roof construction, Internal fixings and fittings construction, Real Life project I & II and Industrial training I & II emphasizing skills acquisition for the workforce to stimulate service delivery and infrastructural development both in private and public sectors. Six (6) other support modules have been identified and included which have to be done by trainees who wish to pursue further education. The support modules include; Technician Mathematics I & II, Communication Skills, Computer Applications, CAD Drawing, Kiswahili and Entrepreneurship Skills.

The modules are flexible and allow candidates interested in academic progression to join at any time while participating in productive activities for community transformation.

2.0 IDENTIFIED MODULES/COMPETENCY AREAS



Independent Modules



3.0 LEARNING OUTCOMES PER MODULE

MODULE NAME: FURNITURE AND CABINET MAKING

Upon successful completion of this module, the trainee will be able to:

(a) Draw and Interpret working drawings.

(b) Make a cutting list.

(c) Select the appropriate materials for furniture and cabinet making.

(d) Make cost estimates for materials used in furniture and cabinet making.

(e) Identify correct tools, equipment and machine for the project/job

(f) Select measure, cut and prepare timber to sizes

(g) Make different types of furniture and cabinets.

(h) Correctly use woodworking machines.

(i) Illustrates the machine shop layout.

MODULE NAME: TEMPORARY STRUCTURES CONSTRUCTION

Upon successful completion of this module, the trainee will be able to:

(a) Draw and Interpret working drawings.

(b) Make a cutting list.

(c) Select the appropriate materials for the project

(d) Make cost estimates for materials used for constructing temporary structures.

(e) Identify and select appropriate tools and equipment used in temporary structures construction.

(f) Construct different types of temporary structures.

MODULE NAME: DOOR AND WINDOW PRODUCTION

Upon successful completion of this module, the trainee will be able to:

(a) Draw and Interpret working drawings.

(b) Make a cutting list.

(c) Select the appropriate materials for the project.

(d) Make cost estimates for materials used in doors and windows production.

(e) Identify correct tools, equipment and machines for the project/job.

(f) Select measure, cut and prepare timber to sizes.

(g) Make different types of doors.

(h) Make different types of windows.

MODULE NAME: ROOF CONSTRUCTION

Upon successful completion of this module, the trainee will be able to:

(a) Identify and select appropriate tools and equipment used in roofing.

(b) Make cost estimates for roof construction.

(c) Prepare and use roofing materials.

(d) Carryout the roofing of buildings.

(e) Construct ceilings in buildings.

MODULE NAME: INTERNAL FIXINGS AND FITTINGS CONSTRUCTION

Upon successful completion of this module, the trainee will be able to:

(a) Draw and Interpret working drawings.

(b) Make a cutting list.

(c) Select the appropriate materials internal fixtures and fittings.

(d) Make cost estimates of materials for internal fixtures and fittings.

(e) Identify and select appropriate tools and equipment used in internal fixtures and fittings construction.

(f) Carryout construction of wall partitions, timber floors, stairs, wall paneling and timber frame, cladding, casing and skirting,

4.0 DETAILED LEARNING CONTENT AND COMPETENCIES FOR FURNITURE AND CABINET MAKING

Sub modules	Competencies	Duties and Tasks	Indicative syllabus Content	Duration Contact hours
Workshop Rules and Safety Regulations	➢ Administer first aid (cuts, electric shocks etc) ➢ Use PPEs ➢ Use, care and maintain tools and equipment ➢ Display charts and fix them to areas prone to accidents	➢ Ensure safety by use of PPEs ➢ Observe workshop safety rules and regulations when using tools and executing practical work.	1. Causes of accidents • Personal habits • Mechanical fault • Electrical safety • Poor workshop organisation/layout 2. First aid 3. Safety gargets 4. Areas prone to accidents: (e.g. bear electrical wires, woodworking machines)	2
Hand Tools and Equipment	➢ Identify various hand tools and their application (e.g. jack plane, hand saw, hammer, and rebate plane). ➢ Correctly handle and use hand tools.	➢ Identify, select and use appropriate tools and equipment in construction works ➢ Cares for and maintains hand tools	1. Hand tools and workshop equipment 2. Classification of hand tools 3. Handling of hand tools 4. Maintenance of tools	8
Woodworking Machines	➢ Identifies different types and uses of power hand tools. ➢ Outlines safety precautions to be observed while using power hand tools. ➢ Describes advantages and disadvantages of power hand tools over fixed machines. ➢ Develop maintenance schedule ➢ Identifies different types of woodworking machines and their functions.	➢ Correctly use hand power tools and woodworking machines in the manufacture of products. ➢ Design the correct machine workshop layout. ➢ Correctly use jigs and patents during	1. Power hand tools and Equipment 2. Types of power hand tools. 3. Functions of power hand tools. 4. Maintenance of portable tools 5. Classification of wood working machines 6. General safety:	12

	➢ Lists down and pins on walls, the safety regulations and precautions to be observed when installing and using machines. ➢ Illustrates the machine shop layout. ➢ Develop maintenance schedule	machines operation. ➢ Carry out machines maintenance	statutory regulations and safety precautions 7. Machine layout 8. Use, operations and safety requirements of: 9. Circular saw 10. Planer 11. Band saw 12. Spindle moulder 13. Mortising machines 14. Wood lathe 15. Sanding machines 16. Marking out for hand and machine works 17. Use of templates and patterns 18. Design of machines, holding, guiding and assembling jigs. 19. Advantages and disadvantages of power hand tools over fixed machines. 20. Maintenance of machines.	
Materials used in furniture & cabinet making	➢ Selects timber by classification, characteristics, and structure. ➢ Converts logs into standard timber. ➢ Seasoning timber. ➢ Identifies timber defects, causes and possible remedies.	➢ Identify different types of timber and their characteristics ➢ Correctly use manufactured boards.	**Timber Technology** ➢ Classes of timber tree (hardwoods and soft woods) ➢ Tree structure (hardwoods and soft	50

	➢ Analyses the advantages of timber over other materials. ➢ Identifies types of manufactured boards. ➢ Sketches and labels different types of manufactured boards. ➢ Describes the process of manufacturing plywood and other manufactured boards. ➢ Distinguishes the advantages and disadvantages of manufactured boards from solid wood. ➢ Sketches and draws sections of manufactured boards. ➢ Definition of adhesives. ➢ Identifies types of adhesives used in wood work. ➢ Prepares adhesives and correctly applies them on the required surfaces. ➢ Describes the properties of different adhesives. ➢ Observes precautionary ➢ Measures while using adhesives. ➢ Identifies types of preservatives and outlines their properties. ➢ Correctly applies wood preservatives on members and structures. ➢ Observes safety precautions when	➢ Correctly use adhesives for assembling joints. ➢ Correctly use wood preservatives. ➢ Correctly use foam in upholstery work. ➢ Correctly use fixing devices on furniture	woods) ➢ Felling and conversion ➢ Seasoning of timber ➢ Defects/degrades ➢ Advantages of timber over other materials **Manufactured Boards** ➢ Type of manufactured boards: - Plywood - Block board - Batten board - Composite board - Fibre board - Laminated board - Veneer board ➢ Production methods of manufactured boards ➢ Hygroscopic nature of manufactured boards ➢ Uses of manufactured boards ➢ Advantages and disadvantages of manufactured boards over solid wood **Adhesives** 1. Types of adhessives ➢ Animal glue ➢ Cashing	

	applying wood preservatives on members and structures. ➢ Uses foam in upholstery work and identifies advantages of foam over timber in construction. ➢ Identifies and sketches different types of fixing devices. ➢ Selects the right type of fixing devices for the right work. ➢ Describes different types of fixing devices. ➢ Applies fixing devices on furniture.		➢ Resin ➢ Vegetable glue 2. Preparation of adhesive for use 3. Properties of adhesive 4. Safe application of adhesives **Wood Preservatives** 1. Types of preservatives, (tar oil, organic solvent and water bone preservatives) 2. Application of preservatives 3. Properties of preservatives 4. Methods of application (Non-pressure and Pressure) 5. Safety precautions when applying preservatives **Foam** ➢ Sources ➢ Application and advantages over timber). **Fixing devices** ➢ Wall plug ➢ Rawl plug	

			➢ Rawl bolt ➢ Wall bracket ➢ Angle bracket ➢ Drawer runner ➢ Drawer lock ➢ Handles	
Furniture making	➢ Classifies woodworking joints. ➢ Applies woodworking joints in construction. ➢ Draws free hand sketches of wood working joints. ➢ Constructs scale drawing of joints. ➢ Draws exploded isometric, oblique views of joints. ➢ make a cutting list ➢ Make estimates cost of materials for furniture construction ➢ Selects the appropriate materials for the project. ➢ identifies correct tools, equipment and machine for the project/job ➢ Select ,measure, cut and prepare timber to sizes ➢ Make the different types of joints use in furniture construction. ➢ Assemble members. ➢ Carryout the sequence of operation in finishing as per the stages of the work,	➢ Identify and make different types of joints used in furniture construction. ➢ Make different types of furniture	1. Wood Working Joints ➢ Classes and sketches of wood working joints: ➢ Framing joints/angle joints (housing , bridal, halving, dovetails, mortise and tenon) ➢ Lengthening joints (scarf, fished, splayed, half lappedjoints,) ➢ Widening joints (rebated, loose tongue, butt, slotscrewed, tongue and grooved) ➢ Functions of wood working joints ➢ Two and three dimension drawings (isometric, oblique,free hand pictorial, exploded sketches, orthographic views) and scale drawing. 2. Types of furniture,	206

			➢ Tables, chairs and seating, beds and desks. ➢ Pews and tracery	
Cabinet making	➢ Prepare a working drawing ➢ make a cutting list ➢ Make estimates cost of materials for cabinet construction ➢ Selects the appropriate materials for the project. ➢ identifies correct tools, equipment and machine for the project/job ➢ Select ,measure, cut and prepare timber/board to sizes ➢ Make the different types of joints use in cabinet construction. ➢ Assemble members. ➢ Carryout the sequence of operation in finishing as per the stages of the work,	➢ Make different types of cabinet ➢ Identify and make different types of joints used in cabinet construction.	**Types of cabinets** ➢ Book shelve, ➢ Cupboard, ➢ Counters ➢ Chests of drawer, ➢ Ward drop ➢ Kitchen unit	60
	Total Duration			**338**

ASSESSMENT STRATEGIES FOR FURNITURE AND CABINET MAKING

This module will consist of two papers including a theory and a practical. Each of the papers will have a continuous assessment and a final exam. The papers will be as follows;

1. NCWT 111 Furniture and Cabinet making (Theory)
2. NCWT 112 Furniture and Cabinet making (Practical)

(a) Continuous assessment. This will be conducted as follows.

i) Theory (40%)

Assignments (15%)

Class tests (25%)

ii) Practicals (40%)

This will consist of;

- Workshop/practical work/expert assignments
- Reports from attended industrial visits, documentaries, Field visits and presentations by professionals.
- Practical tests

iii) Real Life project 100%

iv) Industrial Training 100%

This will be done through the tripartite system of assessment.

(b) Final Examination

(i) Theory examination

This paper will consist of **eight** questions and the candidate will answer **five** questions each carrying 20 marks.

The duration for this paper will be **3 hours.**

(ii) Practical examination

This will consist of **one compulsory practical question** carrying 100%.

The duration for this paper will be **6 hours.**

5.0 DETAILED LEARNING CONTENT AND COMPETENCES FOR TEMPORARY STRUCTURES CONSTRUCTION

Sub modules	Competencies	Duties and Tasks	Indicative syllabus Content	Duration Contact hours
Building Team	➢ Outlines the roles and responsibilities of personnel in the building team. ➢ Correctly makes an organizational structure of the building team.	Outline and describe the responsibilities of individuals in the buildingteam.	**Building Team** ➢ Organization structure ➢ Roles and responsibilities of	12
Materials used in temporary structures	➢ Identifies ferrous and non-ferrous metals by texture and application. ➢ Analyses the uses and advantages of plastics over timber. ➢ Uses foam in upholstery work and identifies advantages of foam over timber in construction. ➢ Analyses the positive and negative effects of force on materials and structures. ➢ Determines moments of force in beams and other structures. ➢ Calculates the mass, volume and density of materials and structures ➢ Calculates work and energy. ➢ Relates principles of work and energy in the construction industry.	➢ Correctly use plastics and metals in formwork. ➢ Determine forces acting in structures. ➢ Observe the principles of work and energy.	**1. Metals, Plastics** ➢ Metal (ferrous and non-ferrous) ➢ Application and advantages over timber ➢ Plastic (sources, application and advantages over timber)	18

Temporary Site Buildings	➢ Identifies temporary site buildings and the materials used for their construction. ➢ Designs, draws and constructs temporary site buildings. ➢ Observes safety precautions when erecting site buildings	➢ Construct temporary site buildings.	Temporary site buildings ➢ Types of temporary site buildings.	12
Site hoarding	➢ Describes site hoarding, its types. ➢ Identifies suitable materials used on site hoardings. ➢ Observes the safety, health and environmental requirements when constructing the site hoarding. ➢ Erects and dismantles site hoardings.	Erects and dismantles site hoardings.	➢ Definition of site hoarding ➢ Types of site hoarding • Boarded hoarding • Plywood hoarding • Hoarding with signboards • Hoarding 3.600 metres high used for site and advertising • Hoarding used with scaffold on pavement. ➢ Safety health environmental requirement for site hoarding ➢ Purpose for site hoarding ➢ Principles, safety, health and environmental	12

			regulations to be observed when working on site hoarding	
Site Measurement	➢ Investigates sites and writes reports. ➢ Clears the site and makes site layout for material delivery and inconvenience. ➢ Sets out the site and its buildings. ➢ Plans and programs site works using bar chart, gantt charts and arrow diagrams. ➢ Estimates, plans and assesses plant and labour output. ➢ Carries out simple site survey, taking of measurements and levelling using dumpy levels and Theodolite or total station. ➢ Correctly levels the site. ➢ Correctly sets out of building structures on site. ➢ Transfers levels from lines onto the foundation plinth wall. ➢ Puts in place all the necessary measures to promote site safety.	➢ Carry out site investigation. ➢ Clear and site out buildings. ➢ Set out buildings. ➢ Carry out site measurements using boning rods, dumpy and water levels.	➢ Site investigation ➢ Site surveying and levelling (to be limited to levelling and brief introduction to levelling equipment like boning rods, dumpy level and water level) ➢ Site clearance ➢ Drawings approval ➢ Setting out by, builder's square, Pythagoras bonding rod among others. ➢ Site lay out ➢ Planning and programming site works using bar charts, gant charts, and arrow diagrams including work measurement, ➢ Plant and labour output ➢ Site safety regulations observed when investigating sites, clearing, setting out and executing	12

			works	
Timbering to trenches	➢ Identifies types of timbering to trenches and the materials required. ➢ Sketches and draws the timbering to trenches. ➢ Erects and dismantles timbering to trenches taking care of all the safety requirements.	Support the trench sides from collapsing into the excavation.	➢ Concept of timbering to trenches ➢ Construction requirements ➢ Types of timbering to trenches • Timbering to lose ground • Timbering to moderately firm ground • Timbering to firm ground ➢ Safety precautions for timbering to trenches	18
Scaffolding	➢ Classifies scaffolds. ➢ Selects the suitable materials for scaffold. ➢ Erects tubular scaffold and wooden scaffold. ➢ Observes the necessary rules and regulations governing scaffold construction. ➢ Constructs ladders and trestles as scaffolds. ➢ Erects gantries. ➢ Stores scaffold materials.	Erect and dismantle scaffoldings during construction activities	➢ Scaffolds, types ➢ Materials, regulations and requirements ➢ Fittings, patent scaffold frames ➢ Tubular scaffolds, fittings ➢ Care of equipment, faults in scaffolds, ladders and folding step ladders ➢ Advantages of tubular scaffold over timer scaffolds	18

			➢ Procedure of erecting tubular scaffold ➢ Gantries, cantilever scaffold ➢ Truss-out scaffold ➢ Suspended scaffold ➢ Mobile scaffold ➢ Safety standards, health and environmental regulations to be put in place and	
Formwork	➢ Describes formwork and its general safety requirements. ➢ Identifies types of materials used, their sizes and lists the merits and demerits of each. ➢ Describes the methods of supporting, easing and striking formwork. ➢ Sketches the formwork with the necessary safety precaution to be observed while working on formwork.	Erect and strike formwork	➢ Formwork for walls, beams, columns and floor slabs ➢ Materials used for construction of formwork ➢ Building regulations governing formwork construction ➢ Functional requirements ➢ Supporting members to arches ➢ Types of formwork for	24

	➢ Erects, supports, strikes and correctly stores formwork materials. ➢ Outlines the safety, health and environmental measures to be taken care of when erecting, supporting, using, striking and storing form work.		beams, columns, stairs and canopy ➢ Safety precautions	
Centering	➢ describes the purpose of a centre in constructing a building, factors influencing the design of wooden centres for various arches ➢ Correctly draws wood centres on their notebooks and labels the various parts of an arch centre and their functions. ➢ Identifies suitable timber and other materials used in the construction of wood centers. ➢ Constructs and supports the wood center.	Erect and strike centre	➢ Types of centres • Turning piece • Rib centre • Build up or laminated centre ➢ General principles of construction ➢ Functional requirements ➢ Procedure of erection ➢ Use of steel props	12
Shoring	➢ Describes shoring, its types, materials, sizes of members and construction	Erect and strike Shoring	➢ Concept of shoring ➢ Types of shores • Raking shore	18

	➢ Safety regulations. ➢ Sketches and draws suitable shoring with all the required safety provisions. ➢ Erects, supports, and strikes shoring system. ➢ Describes shoring, principles and the safety requirements. ➢ Interprets shoring working drawings. ➢ Selects suitable materials for shoring.		• Dead shore • Flying shore ➢ Purpose of shoring ➢ Procedure of erection	
	TOTAL DURATION			**156**

ASSESSMENT STRATEGIES FOR THE TEMPORARY STRUCTURES CONSTRUCTION

This module will consist of two papers including a theory and a practical. Each of the papers will have a continuous assessment and a final exam. The papers will be as follows;

1. NCWT 121 Temporary Structures Construction (Theory)
2. NCWT 122 Temporary Structures Construction (Practical)

(a) Continuous assessment. This will be conducted as follows.

i) Theory (40%)

Assignments (15%)

Class tests (25%)

ii) Practicals (40%)

This will consist of;

- Workshop/practical work/expert assignments
- Reports from attended industrial visits, documentaries, Field visits and presentations by professionals.
- Practical tests.

iii) Real Life project 100%

iv) Industrial Training 100%

This will be done through the tripartite system of assessment.

(b) Final Examination

(i) Theory examination

This paper will consist of **six** questions each carrying 20 marks. The candidate will be required to answer **five** questions.

The duration for this paper will be **3 hours.**

(ii) Practical examination

This will consist of **one compulsory practical question** carrying 100%.

The duration for this paper will be **6 hours.**

6.0 DETAILED LEARNING CONTENT AND COMPETENCES FOR DOORS AND WINDOWS PRODUCTION

Sub modules	Competencies	Duties and Tasks	Indicative syllabus Content	Duration Contact hours
Door shutters	➢ Classifies door shutters (internal and external). ➢ Designs, sketches and draws the types of door shutters. ➢ make a cutting list ➢ Make estimates cost of materials for doors. ➢ Selects the appropriate materials for the project. ➢ identifies correct tools, equipment and machine for the project/job ➢ Select ,measure, cut and prepare timber to sizes ➢ Make the different types of joints use in door construction. ➢ Assemble members. ➢ Carryout the sequence of operation in finishing as per the stages of the work, ➢ Identifies and sketches different types of ironmongery. ➢ Protects ironmongery against corrosion effects. ➢ Selects the right type of ironmongery for the right work. ➢ Describes different types of fixing devices.	1 Make different types of doors 2 Identify and make different types of joints used in doors construction 3 Identify and correctly use ironmongeries.	1. Functional requirement of doors 2. Types of doors 3. Classification of door shutters (internal and external) ➢ Match boarded door ➢ Panel ➢ Flush ➢ Glazed 4. Types of ironmongery ➢ Metal fixing that penetrate timber ➢ Metal fixing that provide security ➢ Metal fixing that allow movement ➢ Specification for ordering ironmongeries ➢ Corrosion effects on materials ➢ Prevention of corrosion ➢ Selection of ironmongery	78

	➢ Identifies associated ironmongeries suitably used with door shutters. ➢ Observes safety measures when making shutters.			
Door frames	➢ Prepare a working drawing. ➢ Make a cutting list. ➢ Make estimates cost of materials for door frames. ➢ Selects the appropriate materials for the project. ➢ identifies correct tools, equipment and machine for the project/job. ➢ Select ,measure, cut and prepare timber to sizes. ➢ Make the different types of joints use in door frame construction. ➢ Assemble members. ➢ Carryout the sequence of operation in finishing as per the stages of the work, ➢ Describes the purpose of door lining and different ways of fixing doorlinings. ➢ Selects suitable types of lining for job at hand. ➢ Illustrates methods of securing door linings to the wall.	➢ Identify and make different types of door frames. ➢ Identify and make different types of joints used in door frame construction. ➢ Make different types of door frames and linings	1. Classification of door frames. 2. Design of door frames. 3. Method of jointing. 4. Method of fixing in position (at head, intermediate, bottom) 5. Types of joints; ➢ housing ➢ through Mortice and wedge joint ➢ draw pin slot mortice joint ➢ Mitre joint 6. Door Lining ➢ Solid /plain lining ➢ Skeleton lining ➢ Framed lining	36

Windows	➢ Identifies different types of windows and the materials used. ➢ Sketches and draws various types of windows and describes their modes of operation. ➢ Sketches types of ironmongeries and states their uses. ➢ Outlines the need for double glazing in casement windows and the safety precautions observed when constructing it. ➢ Constructs casement, sash and dormer windows.	➢ Identify and make different types of windows	1. Functional requirements of windows 2. Types of windows: ➢ Casement windows and solid frames ➢ Lipped sashes ➢ Double glazed windows ➢ Double hung sashes ➢ Dormer windows ➢ Sky lights ➢ Pivot hung sashes and bay windows 3. Associated ironmongeries	36
Construction drawing	➢ Identifies drawing instruments and equipment. ➢ Sets/lays out drawing sheet squarely on the drawing boards. ➢ Applies lines correctly. ➢ Prints letters and numbers correctly. ➢ Selects and applies correct scale. ➢ Draws accurate lines and angles. ➢ Maintains drawing instruments and equipment. ➢ Identifies triangles, quadrilaterals, polygons, circles, ellipses, parabola andhyperbola. ➢ Constructs triangles,	1. Correctly use drawing instruments and equipment to construct geometrical figures. 2. Produce scaled drawings of enlarged and reduced figures 3. Draw correctly geometrical projections. 4. Develop surfaces of solids. 5. Construct arch	1. Introduction to Geometry 2. Geometrical Figures 3. Enlargement and Reduction of Figures 4. Centres 5. Development of Solids 6. Projections 7. Stairs Geometry 8. Splayed Work 9. Roof Geometry	104

	quadrilaterals, polygons, circles, ellipses, parabola and hyperbola. ➢ Applies learnt skills in the construction of different shapes in the workshop/site to design and construct furniture. ➢ Enlarges mouldings and linings. ➢ Reduces mouldings and linings. ➢ Identifies different types of centres and where they are suitably used. ➢ Design, draw and constructs different types of centres. ➢ Observe safety regulations when supporting and constructing centres ➢ Identifies types of solids e.g. pyramids, prisms, cones, cylinders, cubes, spheres. ➢ Constructs pyramids, prisms, cones, cylinders, cubes and spheres. ➢ Develops surfaces of pyramids, prisms, cones, cylinders, cubes, spheres. ➢ Draws elevations, plans/new plans and end views. ➢ Draws true shapes of cut surfaces. ➢ Identifies different methods of projections. ➢ Draws geometrical solids in isometric, oblique, axonometric, auxiliary and perspective projections.	centres construct stairs. 6. Design splayed work. 7. Draw the development roofs surfaces.		

	➢ Produces elevations, plans and sections of solids in 1st angle and 3rd angle orthographic projections. ➢ Converts drawings from isometric, oblique, axonometric to orthographic projection. ➢ Identifies the types of stairs. ➢ Geometrically constructs stair winder and spiral steps. ➢ Determines the number of stair steps for a given headroom. ➢ Draws a storey rods. ➢ Draws and constructs different members of stairs. ➢ Draws hopers, linings, raking mouldings, triangular and circular louvers. ➢ Develops surfaces of hopers, linings, triangular and circular louvers. ➢ Draws side and edge bevels of hopers, triangular and circular louvers. ➢ Draws sections and constructs mouldings. ➢ Produces elevations and sections of triangular and circular louverventilators. ➢ Draws true shape, length of louver, and mitre cut of mouldings and linings. ➢ Designs and draws plans and			

	elevations of different roofs. ➢ Develops different roof surfaces. ➢ Determines true length of roof, the side and edge bevels of roof members.			
	Total duration			**254**

ASSESSMENT STRATEGIES OF THE DOORS AND WINDOWS PRODUCTION

This module will consist of two papers including a theory and a practical. Each of the papers will have a continuous assessment and a final exam. The papers will be as follows;

1. NCWT 211 Doors and windows Production (Theory)
2. NCWT 212 Doors and windows Production (Practical)

(a) Continuous assessment. This will be conducted as follows.

i) Theory (40%)

Assignments (15%)

Class tests (25%)

ii) Practicals (40%)

This will consist of;

1. Workshop/practical work/expert assignments

Reports from attended industrial visits, documentaries, Field visits and presentations by professionals.

v) Practical tests

vi) Real Life project 100%

vii) Industrial Training 100%

viii)

This will be done through the tripartite system of assessment.

(b) Final Examination

(i) Theory examination

This paper will consist of **eight** questions in **two** sections **A (Doors and windows)** and **B (Construction Drawing)** each carrying 20 marks. The candidate will be required to answer **five** questions including **three** questions from section **A** and **two** from section **B**. The duration for this paper will be **3 hours.**

The duration for this paper will be **3 hours.**

(ii) Practical examination

This will consist of **one compulsory practical question** carrying 100%.

The duration for this paper will be **6 hours.**

7.0 DETAILED LEARNING CONTENT AND COMPETENCES FOR ROOF COSTRUCTION

Sub modules	Competencies	Duties and Tasks	Indicative syllabus Content	Duration Contact hours
Roof	➢ Defines roofs ➢ States the function and functional requirements of a roof ➢ Identifies and differentiates the types of roofs ➢ Designs pitch and covering materials used on roof. ➢ Designs, draws roof types, ➢ Interprets drawings. ➢ Selects suitable materials for roofs and ceilings for domestic, industrial andother special buildings. ➢ States the different types of eaves ➢ Constructs roofs.	Carry out roof construction work.	1. Definition 2. Functions of roof 3. Functional requirement 4. Design pitch and covering materials 5. Types of roofs ➢ Single roof, flat roof ,leant-to roof, double lean-to roof, couple roof, closed couple roof, collar tie roof ➢ Double roof ➢ Tripled roof of framed roof ➢ Dormer roof 6. Treatment at eaves**,** Flush eaves, open, closed and socketed eaves.	50
Ceilings	• Selects the suitable ceiling material. • Analyses the advantages of ceiling without joints over jointed ceiling. • Sets out the frame of ceiling. • Finishes the ceiling and its finishing. • Measures and cuts the ceiling boards as on design.	Construct ceilings in buildings	• Types (jointed and joint less ceilings) • Basic requirements • Materials (plaster boards, solid timber, manufactured boards, expanded wiremetal lathe) • Acoustic ceiling • Safety standards, health	18

			and environmental regulations to be put in place andobserved when selecting and constructing ceilings	
Construction Science	➢ Outlines the causes of fire in buildings. ➢ Uses materials that help to control fire spread in buildings. ➢ Describes the behavior of timber with fire, prevents and treats fires inbuildings. ➢ Identifies and observes regulations regarding fire outbreaks and control in buildings. ➢ Calculates the **K, R** and **U** values of common materials. ➢ Describes thermal insulation, condensation, conduction, convection and radiation. ➢ Selects and uses materials used for thermal insulation in construction. ➢ Sketches insulation details suitable to a given situation. ➢ Describes building regulations regarding thermal insulation. ➢ Finishes buildings with thermal insulating materials.	➢ Prevent fire by using correct fire resisting materials and insulations. ➢ Insulate structures against unwanted sound. ➢ Use machines in construction. ➢ Determine beam reactions. ➢ Draw shear force diagrams. ➢ Calculate and draw bending moment diagrams. ➢ Correctly select the materials for a particular job.	**Force** ➢ Definition of forces ➢ Types of forces ➢ Calculation of forces on materials and structures, Mass, density and volume **Work and Energy** ➢ Work ➢ Power ➢ Potential energy ➢ Kinetic energy **Moments** ➢ Concept of moment ➢ Experiment to study moment ➢ Principle of moment ➢ Calculation of moment **Machines** ➢ Definition of a machine ➢ Types of simple machines : levers, pulleys, inclined plane,	72

	➢ Describes sound, sound insulation and sound absorption. ➢ Identifies areas in building where sound transfer can be prevented andthe materials used for sound insulation. ➢ Uses neat sketches to show sound insulation details suitable to a givensituation and material. ➢ Outlines building regulations regarding sound transfer in buildings. ➢ Describes the principles of moments. ➢ Calculates moments of force. ➢ Carries out experiments on the principles of moments. ➢ relates principles of moments to loads in the construction industry ➢ Describes a machines and names types of simples machines used inconstruction. ➢ Calculates the load and effort of levers. ➢ Carries out experiments on the principles of machines. ➢ Relates principles of machines in the construction industry.		gears ➢ wedges, wheel and axle, winch ➢ Mechanical advantages, velocity ratio and efficiency ofmachines **Shear Force** ➢ Definition of shear force ➢ Calculations of shear force ➢ Shear force diagram ➢ Application of shear forces in real life in the world of work. **Beam Reaction** ➢ Definition of a beam ➢ Types of loaded beams ➢ Calculation of beam reactions **Bending Moment** ➢ Definition of bending moment ➢ Calculation of bending moment ➢ Bending moment diagram ➢ Application of bending moments on materials like steel,metal or wooden beams	

	➢ Uses machines in construction. ➢ Calculates shear force and draws its diagram. ➢ Carries out experiments on shear force. ➢ Relates principles of shear force in the construction industry. ➢ Calculates beam reaction. ➢ Carries out experiments on the beam reaction. ➢ Relates principles of beam reaction in the construction industry. ➢ Calculates bending moments. ➢ Draws bending moment diagrams. ➢ Relates principles of bending moments in the construction beams. ➢ Describes elasticity, hooks law (young's modulus of elasticity) and elastic materials used in construction. ➢ Calculates the stress and strain of materials. ➢ Draws the strain/stress graph. ➢ Draws, marks and plots elastic, plastic limits of elasticity while drawingelasticity graph.		**Strength of Materials** ➢ Elasticity ➢ Stress and strain ➢ Calculations of stress and strain ➢ Elasticity graph **Fire Resistant Construction** ➢ Growths of fire in buildings ➢ Surface spread of flame ➢ Behavior of timber in fire ➢ Fire treatments and heat in construction ➢ Building regulations on fire **Thermal Insulation** ➢ Heat transfer (conduction, convection , radiation) ➢ Temperature difference (rate of change) ➢ Thermal conductivity of common material (walls, surfacefinish, roof, floor, insulation) ➢ Thermal insulation to buildings ➢ Building regulation on thermal insulation **Sound Insulation** ➢ Types of sound	

			➢ Nature of sound ➢ Sound absorption ➢ Practical sound insulation ➢ Building regulations on sound insulation ➢	
	Total duration			**140**

ASSESSMENT STRATEGIES FOR ROOF CONSTRUCTION

This module will consist of two papers including a theory and a practical. Each of the papers will have a continuous assessment and a final exam. The papers will be as follows;

1. NCWT 221 Roof Construction (Theory)
2. NCWT 222 Roof Construction (Practical)

(a) Continuous assessment. This will be conducted as follows.

i) Theory (40%)

Assignments (15%)

Class tests (25%)

ii) Practicals (40%)

This will consist of;

- Workshop/practical work/expert assignments
- Reports from attended industrial visits, documentaries, Field visits and presentations by professionals.
- Practical tests

iii) Real Life project 100%

iv) Industrial Training 100%

This will be done through the tripartite system of assessment.

(b) Final Examination

(i) Theory examination

This paper will consist of **eight** questions in **two** sections **A (Roof and Ceiling construction)** and **B (Construction Science)** each carrying 20 marks. The candidate will be required to answer **five** questions including **three** questions from section **A** and **two** from section **B**.

The duration for this paper will be **3 hours.**

(ii) Practical examination

This will consist of **one compulsory practical question** carrying 100%.

The duration for this paper will be **6 hours.**

8.0 DETAILED LEARNING CONTENT AND COMPETENCIES FOR INTERNAL FIXINGS AND FITTINGS CONSTRUCTION

Sub modules	Competencies	Duties and Tasks	Indicative syllabus Content	Duration Contact hours
Timber floors	➢ Defines timber floors ➢ Identifies and differentiates the types of floor ➢ Describes the purpose of floors, their differences and characteristics. ➢ Outlines the ideal requirements for floor design and construction. ➢ Designs, draws floor types,	Construct timber floor	1. Definition of timber floors 2. Function of timber floor 3. Functional requirement 4. Building regulations that govern the construction of floors 5. Construction of different types of timber floor • Timber ground floor • Single floor • Double floor • Tipple or framed floor • Timber upper floor	30
Timber stairs	➢ Defines timber stairs ➢ Identifies different types of stairs ➢ Sets out stairs. ➢ Builds stairs following the building regulations governing theconstruction of private and common stairs in place. ➢ Explains terms used in stairs. ➢ Construct stairs	Construct timber stairs	1. **D**efinitions 2. Terminologies used 9in staircase construction; 3. Types of timber stairs ➢ Straight flight ➢ Quarter turn ➢ Dog leg ➢ Geometrical 4. Building regulations that governed the construction of stairs	18
Partitions	➢ Defines partition ➢ States purpose of partitions	Construct partitions and screens	➢ Definition ➢ Purposes of partition	18

	➢ Describes the differences between a screen and a partition by requirements ➢ Structural stability, aesthetics, ease of fixing and removal when necessary. ➢ Selects suitable materials for construction of partitions and screens. ➢ Designs and makes the partitions and screens. ➢ Creates openings in a partition. ➢ Observes safety measures when making screens and partitions.		➢ The concept of partitions and screens ➢ Types; Stoothed/stud partition; framed/trussed partition ➢ Insulation (sound and heat) ➢ Treatment at openings ➢ Provision for fitting and service access ➢ Construction at openings of a partition	
Timber frame construction	➢ Defines timber frame construction ➢ Identifies and differentiates the types of timber frame construction ➢ Describes design requirements for the construction of timber frames (e.g.balloon and platforms frames). ➢ Select suitable materials ➢ Construct timber frame. ➢ Sketches/draws and interprets working drawings	Construct timber frame construction	➢ Definition ➢ Types of Timber frame construction (balloon frame and platform frame) ➢ Requirement for the construction of timber frame. ➢ Interpretation of the working drawing. ➢ Construction of the timber frames.	12
Wall paneling	➢ Defines wall paneling ➢ Identifies and differentiates the types of wall paneling ➢ design requirements for the construction of wall paneling	Construct wall paneling	➢ Definition. ➢ Types of wall paneling (dado, three quarter and full height paneling)	12

	➢ Select suitable materials ➢ Construct wall paneling. ➢ Sketches/draws and interprets working drawings		➢ Requirement for the construction of wall paneling. ➢ Interpretation of the working drawing. ➢ Construction of the wall paneling	
	Total duration			**90**

ASSESSMENT STRATEGIES FOR INTERNAL FIXINGS AND FITTINGS CONSTRUCTION

This module will consist of two papers including a theory and a practical. Each of the papers will have a continuous assessment and a final exam. The papers will be as follows;

1. NCWT 231 Internal Fixtures and Fittings Construction (Theory)
2. NCWT 232 Internal Fixtures and Fittings Construction (Practical)

(a) Continuous assessment. This will be conducted as follows.

i) Theory (40%)

Assignments (15%)

Class tests (25%)

ii) Practicals (40%)

This will consist of;

1. Workshop/practical work/expert assignments
2. Reports from attended industrial visits, documentaries, Field visits and presentations by professionals.

v) Practical tests

vi) Real Life project 100%

vii) Industrial Training 100%

viii)

This will be done through the tripartite system of assessment.

(b) Final Examination

(i) Theory examination

This paper will consist of **six** questions and the candidate will answer **five** questions each carrying 20 marks.

The duration for this paper will be **3 hours.**

(ii) Practical examination

This will consist of **one compulsory practical question** carrying 100%.

The duration for this paper will be **6 hours.**

Module Structure for National Certificate in Woodwork Technology

S/N	Paper Name	Training duration (hours)
	YEAR ONE	
1.	Furniture and Cabinet Making	338
2.	Temporary Structures Construction	156
3.	Real Life Project I	112
4.	Applied Technician Mathematics I	112
5.	Computer Applications	112
6.	Life skills	56
	Total Duration	**886**
	Recess	
7.	Industrial training I	288
	YEAR TWO	
8.	Doors and windows Production	254
9.	Roof Construction	140
10.	Internal Fixings and Fittings Construction	90
11.	Real Life Project II	112
12.	CAD Drawing	112
13.	Applied Technician Mathematics II	112
14.	Entrepreneurship Skills	84
15.	Basic Kiswahili	56
	Total Duration	**960**
	Recess	
16.	Industrial training II	288

ASSESSMENT PAPER FORMATS FOR NATIONAL CERTIFICATE IN WOODWORK TECHNOLOGY

S/N		Paper Name	Assessment paper format
	YEAR ONE		
1.	NCWT 111	Furniture and Cabinet Making (Theory)	This paper will consist of **eight** questions and the candidate will answer **five** questions each carrying 20 marks. The duration for this paper will be **3 hours.**
2.	NCWT 112	Furniture and Cabinet Making (Practical)	This will consist of **one compulsory practical question** carrying 100%. The duration for this paper will be **6 hours.**
3.	NCWT 121	Temporary Structures Construction (Theory)	This paper will consist of **six** questions each carrying 20 marks. The candidate will be required to answer **five** questions. The duration for this paper will be **3 hours.**
4.	NCWT 121	Temporary Structures Construction (Practical)	This paper will consist of **one compulsory practical question** carrying 100%. The duration for this paper will be **6 hours.**
5.	NCWT 131	Real Life Project I	As before
6.	TCTM 101	Applied Technician Mathematics I	As before
7.	TCCA 101	Computer Applications	As before
8.	TCCS 101	Life skills	As before
9.	NCWT 141	Industrial training I	As before
	YEAR TWO		
10.	NCWT 211	Doors and windows Production (Theory)	This paper will consist of **eight** questions in **two** sections **A (Doors and windows)** and **B (Construction Drawing)** each carrying 20

			marks. The candidate will be required to answer **five** questions including **three** questions from section **A** and **two** from section **B**. The duration for this paper will be **3 hours.**
11.	NCWT 212	Doors and windows Production (Practical)	This will consist of **one compulsory practical question** carrying 100%. The duration for this paper will be **6 hours.**
12.	NCWT 221	Roof Construction (Theory)	This paper will consist of **eight** questions in **tw**o sections **A (Roof and Ceiling construction)** and **B (Construction Science)** each carrying 20 marks. The candidate will be required to answer **five** questions including three questions from section **A** and **two** from section **B**. The duration for this paper will be **3 hours**.
13.	NCWT 222	Roof Construction (Practical)	This paper will consist of one compulsory practical question carrying 100%. The duration for this paper will be 6 hours.
14.	NCWT 231	Internal Fixings and Fittings Construction (Theory)	This paper will consist of **six** questions and the candidate will answer **five** questions each carrying 20 marks. The duration for this paper will be **3 hours.**
15.	NCWT 232	Internal Fixings and Fittings Construction (Practical)	This paper will consist of **one compulsory practical question** carrying 100%. The duration for this paper will be **6 hours**
16.	NCWT 241	Real Life Project II	As before
17.	NCWT 251	CAD Drawing	As before
18.	TCTM 201	Applied Technician Mathematics II	As before
19.	TCBE 201	Entrepreneurship Skills	As before
20.	TCCS 201	Basic Kiswahili	As before
21.	NCWT 261	Industrial training II	As before