

Furniture Design and Construction - National Technical Certificate (NTC) and Advanced National Technical Certificate (ANTC)

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Advanced Furniture Design and Construction

PROGRAMME: ADVANCE NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING

Module: ADVANCED FURNITURE DESIGN AND CONSTRUCTION

Module Code: CFC 21

GOAL: The module is designed to provide the trainee with further knowledge and skill to enable him design, draw and produce complex furniture as a Master craftsman.

General Objectives:

On completion of this module, the trainee should be able to:

1. Know various complex furniture items and their uses
2. Design and develop production drawings of complex furniture
3. Produce a chosen complex furniture
4. Produce an upholstery carcass of a chosen design
5. Prepare jigs, fixtures and mould
6. Produce a built-in furniture
7. Appreciate a good surface finish of furniture item and produce one.
8. Carry out inspection of finished product to maintain standard and quality

PROGRAMME: ADVANCE NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING			
Module: ADVANCED FURNITURE DESIGN AND CONSTRUCTION		Module Code: CFC 21	Contact Hours:
Module Specification: Theoretical Content			
General Objective: 1.0 Know various complex Furniture items and their uses.			
Week	Specific Learning Objective:	Teachers Activities	Resources
1-4	1.1 Identify various types of complex furniture e.g. <ul style="list-style-type: none"> a. Conference tables b. Extending tables, c. Executive tables and chairs d. Convertible chair e. Cocktail cabinet f. Writing bureau g. Corner cabinet 1.2 Appreciate the geometrical shape of the above listed furniture items	<ul style="list-style-type: none"> • Identify and explain various types of complex furniture items such as: conference tables, extending table, executive tables, and chairs etc. • Ask the student to explain the difference between each of the tables. 	<ul style="list-style-type: none"> • Chalk board • Pictures of complex furniture • Drawings
5	1.3 Explain the principles and application of knock-down fittings 1.4 Explain the application of the following fittings and fixtures e.g. <ul style="list-style-type: none"> a. Swivel bases b. Convertible and collapsible attachments c. Bar counters and d. Reception counters 	<ul style="list-style-type: none"> • Explain the principles and application of knock down fittings, the applications of fittings and fixtures such as: bar counter, swivel bases etc. 	<ul style="list-style-type: none"> • Chalk • Samples of moulds, jigs and fixtures
General Objective 2.0 Jigs fixtures and mould			
Week	Specific Learning Objective:	Teachers Activities	Resources
6	2.1 Explain the purpose and application of jigs, fixtures and moulding	<ul style="list-style-type: none"> • Explain the difference between jigs, fixtures and moulds and state their uses. 	

PROGRAMME: ADVANCE NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING			
Module: ADVANCED FURNITURE DESIGN AND CONSTRUCTION		Module Code: CFC 21	Contact Hours:
Module Specification: Theoretical Content			
General Objective 3.0: Good Surface Finish			
Week	Specific Learning Objective:	Teachers Activities	Resources
7 8	3.1 Explain the reaction of material on surfaces e.g. oxidation 3.2 Explain the methods of surfacing (hot or cold)e.g. by, a. Dipping b. Spraying c. Roller grain printing, etc 3.3 State the characteristics of nitro-cellulose, synthetic, enamel materials, etc. 3.4 Name the solvents required to remove paints from materials e.g. a. Painter remover b. Thinner c. Turpentine d. Pulling over 3.4 State the NSC quality control standard for furniture item	<ul style="list-style-type: none"> • Explain the importance of good finishing in furniture production. • Explain the hot or cold methods of surfacing by dipping, spraying, roller grain printing etc. • Explain the chemical composition of thinner, etc 	<ul style="list-style-type: none"> • Furniture item • Chalk board and charts.
General Objective 4.0: Estimating			
Week	Specific Learning Objective:	Teachers Activities	Resources
9-12	4.1 Understand the principles of estimating in furniture production. 4.2 Estimate the materials used in furniture item production such as; wood, adhesive, fittings, fabrics, finishing etc, Cost the items according to local price. 4.3 Understand the method of computing the final estimate taking into consideration labour cost, overhead cost and profit margin. 4.4 Make estimate for a simple furniture item	<ul style="list-style-type: none"> • Discuss estimating with students and guide them to draw up an estimate for a simple furniture project. • Produce an in-built furniture and finish it. • Make a cost estimate of the furniture item. 	<ul style="list-style-type: none"> • Text books • Chalk board Lesson notes.
TESTING Theory - 30% Practical - 70%			

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING			
Module: ADVANCED FURNITURE DESIGN AND CONSTRUCTION		Module Code: CFC 21	Contact Hours:
Module Specification: Practical Content			
General Objective 1.0: Use tools and equipment safely to produce complex period furniture to industrial standard.			
Week	Specific Learning Objective:	Teacher Activities	Resources
1-4	1.1 Translate imagination of complex furniture into sketches, e.g. beds, counters and cupboard 1.2 Inculcate briefs and data into the sketches. 1.3 Develop sketches into pictorial projections 1.4 Develop sketches into production drawings. 1.5 Provide blue prints.	<ul style="list-style-type: none"> • Illustrate imaginative ideas of complex furniture into sketches. • Guide the students on how to translate imaginative thoughts into sketches, develop the sketches into pictorial projects and then into working drawings. 	<ul style="list-style-type: none"> • Sketches, • Drawings • Materials, etc. • Tools.
General Objective 2.0: Produce Complex Furniture			
Week	Specific Learning Objective:	Teacher Activities	Resources
5-7	2.1 Set out and mark out the shapes 2.2 Cut out the shapes 2.3 Lay out the methods of construction 2.4 Application of joint e.g. mortise and tenon, tongue and grove. Etc. 2.5 Join and assemble all components applying all the principles of construction. 2.6 Construct jigs, fixtures and mould.	<ul style="list-style-type: none"> • Select specific complex furniture, set out and mark out the shapes. • Ask the students to cut the shapes and lay out the methods of construction using the various types of joints, e.g. mortise and tenon tongue and groove, etc. • Guide the students to construct jigs, fixtures and moulds. 	- do -

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING			
Module: ADVANCED FURNITURE DESIGN AND CONSTRUCTION		Module Code: CFC 21	Contact Hours:
Module Specification: Practical Content			
General Objective 3.0: Carcase of Chosen Design			
Week	Specific Learning Objective:	Teacher Activities	Resources
8	3.1 Recognise a good carcase arrangements e.g. circular or semi-circular shape. L-shape, U-shape, Serpentine shape. 3.2 Construct a complex carcase applying all the principles of construction e.g. corner upholstered divan bed	<ul style="list-style-type: none"> • Select a good carcase arrangements for example, U-shape, L-shape, circular or semicircle shape etc. • Guide the students to construct the carcase of any of the shapes • Apply all the principles of construction. 	- do-
General Objective 4.0: Built In Furniture			
Week	Specific Learning Objective:	Teacher Activities	Resources
9	4.1 Prepare ground work for panelling or partitioning 4.2 Fix the wall plugs or masonry walls. 4.3 Construct boards and panels.	<ul style="list-style-type: none"> • Explain the basic method of groundwork for panelling or partitioning. • Guide the students to construct boards and panels and fix wall plugs on masonry walls. 	<ul style="list-style-type: none"> • Tools and materials like masonry nails, wood etc.
General Objective 5.0: Good Surface Finish			
Week	Specific Learning Objective:	Teacher Activities	Resources
10-11	5.1 Prepare and treat surfaces 5.2 Apply wax polishing 5.3 Use spraying equipment and brush, rollers, etc	<ul style="list-style-type: none"> • Guide the students to produce a given furniture surface, apply, spray finish to industry standard using any acceptable method. • Explain the hot or cold methods of surfacing by dipping, spraying, roller grain printing etc. • List type of solvents and their applications in relation to list, spraying equipment, brush and rollers etc. 	<ul style="list-style-type: none"> • Finishing Equipment and materials.

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING			
Module: ADVANCED FURNITURE DESIGN AND CONSTRUCTION		Module Code: CFC 21	Contact Hours:
Module Specification: Practical Content			
General Objective 6.0: Inspection of Finished Products			
Week	Specific Learning Objective:	Teacher Activities	Resources
	6.1 Appreciate a good finish within standard 6.2 Detect defect in finished furniture item 6.3 Recognize and approve well-finished products.	<ul style="list-style-type: none"> • Guide students to appreciate a good finish. • Explain and identify defect in finish furniture item. 	<ul style="list-style-type: none"> • Sample of well finished furniture items like stools, chairs, beds and storing units.
13	Examination: Practical - 70% Theory - 30%		

Advanced Machine Wood Working

PROGRAMME: ADVANCE NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING

Module: ADVANCED MACHINE WOOD WORKING

Module Code: CM W 22

GOAL: The module is designed to provide the trainee with further knowledge and skill in the use, maintenance and repair of (a) Straight line edgers (b) Double-end tenoning machine (c) Moulding machine

General Objectives:

On completion of this module, the trainee should be able to:

1. Apply all safety precautions involved in the operation of straight line edgers, moulding machines and double and tenoning machines
2. Understand the working principle of a straight line-edging machine and be able to use it to carry out various woodworking processes.
3. Maintain straight-line edgers in proper working conditions.
4. Understand the working principle of a moulding machine and be able to use the machine to carry out various moulding operations.
5. Maintain the moulding machine its accessories and cutters in proper working conditions.
6. Understand the working principle of a double end tenoning machine and be able to use the machine in the production of component parts of joinery or furniture items
7. Maintain the double-end tenoning machine in proper working conditions.

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING			
Module: ADVANCED MACHINE WOODWORKING		Module Code: CMW 22	Contact Hours:
Module Specification: Theoretical Content			
General Objective 1.0: Apply all safety precautions involved in the operation of straight line edger, moulding and double end tenoning machines:			
WEEK	Specific Learning Outcome	Teachers Activities	Resources
1-4	1.1 Explain the working principles of the straight line edging machine 1.2 List the sequence of operations of straight line edging machine 1.3 List the merits and demerits of design of overhead and under-head machines 1.4 State reasons why it is not necessary to fix the riving knife. 1.5 State the range of purposes for the variations in feed speed.	<ul style="list-style-type: none"> • Introduce students to the straight line-edging machine. • Ask the students to identify and explain the functions of the parts 	<ul style="list-style-type: none"> • Charts/posters • Chalkboard • Edging Machine
General Objective 2.0: The Moulding Machine			
WEEK	Specific Learning Outcome	Teachers Activities	Resources
	2.1 Explain the working principles of a moulding machine e.g. Spindle moulder 2.2 Describe the layout of the 4, 5, and 6 heads moulding machine e.g. four sided moulding machine 2.3 Identify the parts of the machine and the functions of the various heads and parts 2.4 List and explain the different types of feeds e.g. hand feed. 2.5 Describe the purpose of serrated, and smooth feed rollers. 2.6 Explain and state the uses of hopper feed attachment and feeding table 2.7 State the purpose of profile blocks, mount and use them on the machine	<ul style="list-style-type: none"> • Explain the different types of moulding machines and their scope of functions. • Explain types of profiles and their uses. 	<ul style="list-style-type: none"> • Chalk board • Charts • Slides • Audio visual aid. • Chalk board • Tools & equipments and accessories.

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING			
Module: ADVANCED MACHINE WOODWORKING		Module Code: CMW 22	Contact Hours:
Module Specification: Theoretical Content			
General Objective 3.0: Double-end Tenoning Machine			
WEEK	Specific Learning Outcome	Teachers Activities	Resources
	3.1 Explain the difference between the single-end and the double-end tenoning machines 3.2 Explain the working principles of the double-end tenoning machines. 3.3 Identify and describe the various parts and accessories of the machine e.g. fixed, adjustable dogs, etc.	<ul style="list-style-type: none"> • Explain the difference between double-end and single-end tenoning machines, explain their working principles and describe their of various parts. 	- do -
General Objective 4.0: Wood Lathe Turning Machine			
WEEK	Specific Learning Outcome	Teachers Activities	Resources
	4.1 Explain the working principles of the turning lathe machine 4.2 Identify wood turning lathe tools and explain their various shape and their uses e.g. gauge, skew, spear point. Painting tool, round nose tool. 4.3 Explain the functions of the parts of the wood turning lathe machine, e.g. beds, head stock, tail stock, drawing stand, tool rest, etc.	<ul style="list-style-type: none"> • Explain the difference between a wood turning lathe and a metal turning lathe. • Describe the working principles and tools and their functions. 	- do -
13	Examination: Practical - 70% Theory - 30%		

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING			
Module: ADVANCED MACHINE WOODWORKING		Module Code: CMW 22	Contact Hours: 120
Course Specification: Practical Content			
General Objective 1.0: Apply all safety precautions involved in the operation of straight line edger, moulding machines and double end-tenoning Machines and operate the machines to accomplish any given furniture construction operation.			
WEEK	Specific Learning Outcome	Teacher Activities	Resources
1-2	1.1 Isolate the machines from source of power before and after operations; 1.2 Wear protective clothing during all operations; 1.3 Adjust the pressure bar to the thickness of the timber while operating straight line edger to avoid tendency of timber to kick backwards; 1.4 Locate and secure the cutter blocks, cut-off saws, guards and adjust pressure beam in double end tenoning machine before operating it.	<ul style="list-style-type: none"> • Guide the students to carry out the various operations on machines to accomplish a given task, observing the necessary safety and operational procedures. • Carry out routine maintenance of the machines. 	<ul style="list-style-type: none"> • Materials • Machines and accessories
General Objective 2.0: Features & Principles Of Operation Of Straight Line Edger			
WEEK	Specific Learning Outcome	Teacher Activities	Resources
3	2.1 Set up straight line edging machine for safe operation adjust saws, fences, pressure beams, before switching on machine; 2.2 Carry out all straight-line edger operations accurately.	- do -	- do-.
General Objective 3.0: Straight Line Edger Maintenance			
WEEK	Specific Learning Outcome	Teacher Activities	Resources
4-5	3.1 Clean up and oil saws; 3.2 Set and sharpen saws by machine 3.3 Remove saw dust from the machine and keep the surrounding clean using electric blower 3.4 Oil and grease regularly the nipples and roller bearings of the machine 3.5 Oil and grease the moveable parts to minimize friction		

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING			
Module: ADVANCED MACHINE WOODWORKING		Module Code: CMW 22	Contact Hours: 120
Course Specification: Practical Content			
General Objective 4.0: The Moulding Machine			
WEEK	Specific Learning Outcome	Teacher Activities	Resources
6	4.1 Remove and mount each block on the machine correctly. 4.2 Prepare setting plates; 4.3 Set cutters on each block using any of the following methods: (a) Using templates (b) setting from a given mould 4.4 Grind, hone and sharpen cutters to predetermined shapes; 4.5 Set the machine for any form of moulding operations	- do	- do
7	4.6 Operate and adjust the hopper feed attachment and feeding table; 4.7 Set and use the splitting saws on the beading head in production line. 4.8 Use the machine to produce various types of moulding	- do -	- do -
General Objective 5.0: Moulding Machine Maintenance			
WEEK	Specific Learning Outcome	Teacher Activities	Resources
	5.1 Sharpen cutters regularly and properly NOTE: Cutters must be balanced before fitting into cutter blocks. 5.2 Use electric blower or other devices to clean the machine regularly.	- do -	- do -

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING			
Module: ADVANCED MACHINE WOODWORKING		Module Code: CMW 22	Contact Hours: 120
Course Specification: Practical Content			
General Objective 6.0: Double-end Tononing Machine			
WEEK	Specific Learning Outcome	Teacher Activities	Resources
9	6.1 Set up the double-end tononing machine 6.2 Produce various components of joinery or furniture items using the double end-tononing machine.	- do -	- do -
General Objective 7.0: Maintenance Of Double-End Tononing Machine			
WEEK	Specific Learning Outcome	Teacher Activities	Resources
10	7.1 Plan the servicing of the machine with particular attention to cleaning of the chains, tracks or slots regularly; 7.2 Clean and lubricate the machine.	- do -	- do -
General Objective 8.0: Wood Lathe Turning Machine			
WEEK	Specific Learning Outcome	Teacher Activities	Resources
11-12	8.1 Operate the hand turning lathe. 8.2 Produce furniture components e.g. turned table leg, bed leg, and stool leg. Etc. 8.3 Apply safety rules/ precautions e.g. wearing of apron, goggles, hand gloves, etc. 8.4 Clean machine after use. 8.5 Grease and oil machine after use.		
Examination:- Theory 30% Practical 70%			

Advanced Upholstery Design/Period furniture design and construction

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING	
Module: ADVANCED UPHOLSTERY DESIGN AND CONSTRUCTION AND PERIOD FURNITURE	Module Code: CFC 22
GOAL: This module is designed to provide to provide the trainee with further knowledge and skill to enable him design and construct complex furniture and auto upholstery.	
General Objectives:	
<ol style="list-style-type: none">1. On completion of this module, the trainee should be able to:2. Design and develop complex upholstered furniture and auto upholstery3. Construct an auto-upholstery4. Construct a complex upholstery furniture	

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING			
Module: ADVANCED UPHOLSTERY DESIGN AND CONSTRUCTION AND PERIOD FURNITURE		Module Code: CFC 22	Contact Hours:
Module Specification: Theoretical Content			
General Objective 1.0: Understand history of Period Furniture.			
Week	Specific Learning Outcome	Teachers Activities	Resources
1-5	1.1 Narrate the history of period furniture starting from the Gothic, the renaissance and the contemporaries.	<ul style="list-style-type: none"> • Explain the history of furniture styles beginning from the earliest time of Renaissance to the contemporaries. • Explain the type of materials used e.g. bronze, wood which were made by the Egyptian, Greeks, Italians etc. 	<ul style="list-style-type: none"> • Text book • Lesson note • Chalk board • Pictures
General Objective 2.0: Furniture Styles			
Week	Specific Learning Outcome	Teachers Activities	Resources
	2.1 Explain the traditional styles of furniture and how they originated 2.2 Explain the provincial styles of furniture and how they originated 2.3 Explain the contemporary styles of furniture and how they originated. Identify period furniture items. 2.4 Comprehend the complexity of period furniture - coronation chair, carve doors and panels, curved chair backs, etc. 2.5 Explain methods of cutting shapes and figures	<ul style="list-style-type: none"> • Name the furniture styles and explain the traditional styles of furniture and how the originated were their furniture carved from wood • Explain the contemporary styles of furniture and how they originated. • Identify types of furniture made during the: 13th and 14th century (Italian Style), 15th and 16th century (Renaissance style, 17th century (Baroque style) etc 	<ul style="list-style-type: none"> • Text book • Lesson note • Chalk board • Pictures
General Objective 3.0: Complex Upholstered Furniture			
Week	Specific Learning Outcome	Teachers Activities	Resources
11-12	3.1 Translate imaginative concepts into sketches. 3.2 Translate sketches to pictorial projections and working drawing	<ul style="list-style-type: none"> • Sketch a design and draw to required specification a model upholstery armchair. • Translate the imaginative sketch into real physical model. 	<ul style="list-style-type: none"> • Text book • Lesson note • Chalk board • Pictures

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING			
Module: ADVANCED UPHOLSTERY DESIGN AND CONSTRUCTION/PERIOD FURNITURE		Module Code: CFC 22	Contact Hours: 23 6
Module Specification: Practical Content			
General Objective: Understand history of period furniture and produce period furniture up to factory standard			
Week	Specific Learning Objective	Teacher Activities	Resources
1-4 5	1.1 Draw and produce a variety of templates, e.g. cabriole legs, turned and fluted legs, etc. 1.2 Use the templates to mark and cut the required shape. 1.3 Dress shapes with hand tools and machines. 1.4 Select and mark out joints. 1.5 Assemble simple period furniture. 1.6 Draw and develop templates for various shapes. 1.7 Produce creative construction for beauty of period furniture. 1.8 Use hand and power tools to produce variety of shapes and figures on the surface of period furniture, e.g. engraving machine, carving chisel. 1.9 Join and assemble the furniture units together.	<ul style="list-style-type: none"> • Ask the students to produce: (a) sketches and designs (b) templates (c) selected joints. • Guide the students to develop and produce templates using power tools and hand tools. 	<ul style="list-style-type: none"> • Drawing instruments • Tools and equipments • Materials • Tool & equipments
General Objective 2.0: Complex Upholstered Furniture			
Week	Specific Learning Objective	Teacher Activities	Resources
6-9	2.1 Determine appropriate sizes from preliminary free hand sketches. 2.2 Translate to pictorial projections and working drawing 2.3 Develop patterns and Cut to shape. 2.4 Interpret the working diagram of the complex furniture e.g. period furniture 2.5 Construct the complex upholstered furniture following a stated sequence	- do -	- do -

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING			
Module: ADVANCED UPHOLSTERY DESIGN AND CONSTRUCTION/PERIOD FURNITURE		Module Code: CFC 22	Contact Hours: 23 6
Module Specification: Practical Content			
General Objective 3.0: Auto Upholstery			
Week	Specific Learning Objective	Teacher Activities	Resources
10-12	3.1 Apply serpentine or coil spring with necessary clips 3.2 Stitch and weave springs 3.3 Burlap the springs 3.4 Stuff the frame 3.5 Cut and sew to pattern 3.6 Cover the frame and secure with clips	<ul style="list-style-type: none"> • Ask the student to make sketches of a chosen car seat. • Identify types of springs used for car seats and method of padding seats. • Carry out stuffing, burl-aping of the springs. • Demonstrate how patterns are cut, sewing, covering and securing of seats with clips. Guide the students to design and produce a chosen car seat to industry standard. 	<ul style="list-style-type: none"> • Tools and equipment • Materials
13	Examination: Theory 30% Practical 70%		