

FEDERAL MINISTRY OF EDUCATION

National Technical Certificate (NTC) Curriculum in

FURNITURE MAKING AND UPHOLSTERY

February, 2025



Innovation Development and Effectiveness in the Acquisition of Skills (IDEAS) Project

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THE WORLD BANK

NATIONAL BOARD FOR TECHNICAL EDUCATION

Plot B, Bida Road, P.M.B. 2239, Kaduna, Nigeria



NATIONAL TECHNICAL CERTIFICATE

CURRICULUM AND MODULE SPECIFICATIONS

IN

FURNITURE MAKING AND UPHOLSTERY

FEBRUARY, 2025

GENERAL INFORMATION

AIM:

To give training and impart the necessary skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant.

ENTRY QUALIFICATIONS CRAFT PROGRAMME

Candidates must not be less than 14 years of age and should have successfully completed three years of Junior Secondary Education, Prevocational 1-3 or its equivalent. Special consideration may be given to sponsored candidates with lower academic qualifications who hold trade test certificates and are capable of benefiting from the programme.

THE CURRICULUM

The Curriculum of each programme is broadly divided into three components:

- a. General Education, which accounts for 30% of the total hours required for the programme.
- b. Trade Theory, Trade Practice and Related Studies which account for 55% and
- c. Supervised Industrial Training/Work Experience, which accounts for about 15% of the total hours required for the programme. This component of the course which may be taken in industry or in college production unit is compulsory for the full-time students.

Included in the curriculum is the teacher's activity and learning resources required for the guidance of the teacher.

Unit Course/Module

A Course/Module is defined as a body of knowledge and skills capable of being utilized on its own or as a foundation or pre-requisite knowledge for more advanced work in the same or other fields of study. Each trade when successfully completed can be used for employment purposes.

BEHAVIOURAL OBJECTIVES

These are educational objectives which identify precisely the type of behaviour a student should exhibit at the end of a course/module or programme. Two types of behavioral objectives have been used in the curriculum. They are:

- a General Objectives
- b Specific Learning Outcomes

General Objectives are concise but general statements of the behaviour of the students on completion of a unit of work such as understanding the principles and application.

- a. Orthographic Projection in Engineering/Technical Drawing
- b. Loci in Mathematics
- c. Basic Concepts of Politics and Government in Political Science
- d. Demand and Supply in Economics

Specific Learning Outcomes are concise statements of the specific behaviour expressed in units of discrete practical tasks and related knowledge the students should demonstrate as a result of the educational process to ascertain that the general objectives or course/programme have been achieved. They are more discrete and quantitative expressions of the scope of the tasks contained in a teaching unit.

GENERAL EDUCATION IN TECHNICAL COLLEGES

The General Education component of the curriculum aims at providing the trainee with complete secondary education in critical subjects like English Language, Economics, Physics, Chemistry, Biology, Entrepreneurial Studies and Mathematics to enhance the understanding of machines, tools and materials of their trades and their application and as a foundation for post-secondary technical education for the above average trainee. Hence, it is hoped that trainees who successfully complete their trade and general education may be able to compete with their Secondary School counterparts for direct entry into the Universities, Polytechnics or Colleges of Education (Technical) for BTech, BSc, ND or NCE courses respectively. The Social Studies component is designed to broaden the trainee's social skills and understanding the environment.

For purpose of certification, only the first three courses in Mathematics will be required. The remaining modules are optional and are designed for the above average students.

National Certificate

The NTC programme is run by Technical Colleges accredited by NBTE

NABTEB conducts the final National Examination and awards certificates.

Trainees who successfully complete all the courses/modules specified in the curriculum table and passed the National Examinations in the trade will be awarded of the following certificates.

LEVEL	CERTIFICATE
Technical Programme	Furniture Making and Upholstery
Craft Level	National Technical Certificate

NATIONAL TECHNICAL CERTIFICATE

Guidance Notes for Teachers Teaching the Curriculum

The number of hours stated in the curriculum table may be increased or decreased to suit individual institutions' timetable provided the entire course content is properly covered and the goals and objectives of each module are achieved at the end of the term.

The maximum duration of any module in the new scheme is 300 hours. This means that for a term of 15 weeks, the course should be offered for 20 hours a week. This can be scheduled in sessions of 4 hours in a day leaving the remaining hours for general education. However, (properly organized and if there are adequate resources), most of these courses can be offered in two sessions a day, one in the morning and the other one in the afternoon. In so doing, some of these programmes may be completed in lesser number of years than at present.

The sessions of 4 hours include the trade theory and practice. It is left to the teacher to decide when the class should be held in the workshop or in a lecture room.

INTEGRATE APPROACH IN THE TEACHING OF TRADE.

Theory, Trade Science and Trade Calculation

The traditional approach of teaching trade science and trade calculation as separate and distinct subjects in technical college programmes is not relevant to the new programme as it will amount to a duplication of the teaching of mathematics and physical science subjects in the course. The basic concepts and principles in mathematics and physical science are the same as in the trade calculation and trade science. In the new scheme therefore, mathematics and physical science will be taught by qualified persons in these fields and the instructors will apply the principles and concepts in solving trade science and calculation problems in the trade theory classes. To this end, efforts have to be made to ensure that mathematics and science modules required to be able to solve technical problems were taken as pre-requisite to the trade module.

Evaluation of Programme/Module

For the programme to achieve its objectives, any course started at the beginning of a term must terminate at the end of the term.

Instructors should therefore device methods of accurately assessing the trainees to enable them give the student's final grades at the end of the term. A national examination will be taken by all students who have successfully completed their modules. The final award will be based on the aggregate of the scores attained in course work and the national examination.

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	PROGRAMME: 1	NATI	ONA	L TEC	CHNI	CAL	CER	ΓIFI	CATE	IN I	FURNI	TURI	E MA	KING	AND	UPHC)LSTE	ERY		
Module Code	MODULE			YEA	RI					YF	EAR 2					YEA	AR 3			TOTAL
		Tern	n 1	Tern	n 2	Ter	m 3	Te	rm 1	Te	rm 2	Ter	m3	Tern	n 1	Terr	n 2	Ter	m 3	HOURS
		Т	Р	Τ	Р	Т	P	Т	Р	Т	Р	Т	P	Т	P	Т	Р	Т	Р	
CMA 12-15	Mathematics	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	1	-	216
CEN 10-12	English and Communication	2	-	2	-	2	-	3	-	3	-	3	-	2	-	3	-	3	-	288
CPH 11-12	Physics	2	2	2	-	2	-	2	1	2	1	2	1	2	1	1	1	2	1	288
CCH 10	Chemistry	2	2	2	-	2	-	2	1	2	1	2	1	2	1	2	1	2	1	288
CEC 10	Economics	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	252
CBM 10	Entrepreneurship	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2	-	2	-	72
CTD 11	Technical Drawing	-	2	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	72
CTD 12	Descriptive Drawing	-	-	-	-	-	-	2	-	2	-	2	-	-	-	-	-	-	-	72
ICT 10	Introduction to Computer	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	36
ICT 11	Computer Application I	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	36
ICT 12	Computer Application II	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	36
ICT 13	AutoCAD	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	36
ICT 14	AutoCAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2			36
CMW 11	Fundamentals of Woodworking I	2	8			-	-	-	-	-	-	-	-	-	-	-	-	-	-	120
CMW 12	Fundamentals of Woodworking II	-	-	-	-	-	-	3	17	-	-	-	-	-	-	-	-	-	-	240
CPD 12	Wood and Metal Finishing	-	-	-	-	-	-	-	-	-	-	-	-	3	17	-	-	-	-	240
CME 11	General Metal Work I			2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84
CME 12	General Metal Work II	-	-	-	-	-	-	2	3	-	-	-	-	-	-	-	-	-	-	60

CURRICULUM TABLE COURSE HOURS/WEEK PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FURNITURE MAKING AND UPHOLSTERY

CFC 11	Furniture Design and Construction I	-	-	-	-	3	12	-	-	-	-	-	-	-	-	-	-	-	-	180
CFC 12	Furniture Design and Construction II		-	-	-	-	-	-	-	2	8			-	-	-	-	-	-	120
CFC 13	Furniture Design and Construction III		-	-	-	-	-	-	-	-	-	-	-	-	-	2	10	-	-	144
CFC 12	Upholstery Design and Construction	-	-	-	-	-	-	-	-	-	-	-	-	3	17	-	-	-	-	240
	Total	12	14	12	7	13	14	19	24	16	12	14	4	19	38	15	14	12	2	261

PRO	GRAMME: NATIO	NAL TECHNICAL CERTI	FICATE IN FUNITURE M	IAKIN	NG AND UPHOLSTERY.							
MOD	ULE: FUNDAMEN	NTAL OF MACHINE WOO	DOWORKING I	MOI	DULE CODE: CMW 11	TOTAL	CONTACT					
						HOURS: 2	40HRS					
YEA	R: 1	TERM: 1	PRE: REQUISITE:		Theoretical: 24 Hours							
					Practical: 96 Hours							
Goal:	Goal: This module is intended to introduce the student to the basics of machine woodworking.											
GEN	ERAL OBJECTIVE	ES:]										
On co	mpletion of this mod	lule, the trainee should be able	e to:									
1.	Know the operation	of Pull-Over Cross Cutting M	Iachine									
2.	Know the operation	of Circular Saw										
3.	Understand the oper	ration of Dimension Saw										
4.	Know the operation	of Surface Planer										
5.	Understand the oper	ration of Combined Planer/ Th	nicknesser									
6.	Know the preparation	on and use of setting out rods.										
7.	Know band sawing	0										
8.	Know CNC router of	•										

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FUNITURE MAKING AND UPHOLSTERY.												
Module	e: Fundament	al of Machine W	Voodworkii	ng 1			MOUDLE CODE: C	CT HOURS:				
										120		
Module	Module Specification: Theoretical and Practical Content											
YEAR:	1	TERM: 1	1	PRE: REQUIS	ITE:	Theoret	ical: 24 Hours					
						Practical: 96 Hours						
GOAL	: This module	is designed to in	ntroduce the	e trainee to the b	oasics (of machin	e woodworking					
Theore	tical Content						Practical Content					
Genera	General Objective 1.0: Know the operation of pull-Over Cross Cutting Machine											
Week Specific Learning Teachers Learning							Specific Learning		Teachers		Learning	
	Outcome		Activities	Res	source	S	Outcome		Activities		Resources	

1-3	1.1 Discuss the uses of	Explain the uses of	Whiteboard	Identify the parts of pullover	Guide the students	Pullover cross
10	Pullover cross cutting	Pullover cross	Marker	cross cutting machine.	to:	cutting machine
	machine.	cutting machine.	Projector	6		0
		0	Computer	Identify types of cutters and	Identify the parts	Pullover cross
	1.2 List the parts of	Discuss the parts	Wall chart	accessories used on the	of pullover cross	cutting machine
	pullover cross cutting	of pullover cross	Lesson notes	machine.	cutting machine.	accessories.
	machine.	cutting machine.	Posters			
				Operate Pullover cross	Identify types of	
	1.3 State the properties of	Explain the		cutting machine.	cutters and	
	materials used in	properties of			accessories used on	
	making the part of the	materials used in			the machine.	
	machine.	making the part of				
		the machine.			Operate Pullover	
	1.4 State the principles of	Elaborate the			cross cutting	
	operation of the	principles of			machine.	
	machine.	operation of the				
		machine.				
	1.5 State the basic function	Explain the basic				
	of the machine.	function of the				
		machine.				
	1.6 List the types of	E1				
	hazards related to the	Explain the types of hazards related				
	use of the machine.	to the use of the				
	1.7 State the potential	machine.				
	causes of the hazards.	Explain the				
	causes of the hazards.	potential causes of				
		the hazard.				
	1.8 State necessary	the huzura.				
	operational Precautions	Discuss necessary				
	to be taken when using	operational				
	the machine.	Precautions to be				
		taken when using				
	1.9 List the types of cutters	the machine.				
	and accessories used on					

	the machine. 1.10 Explain the use of each type of cutter and accessory.	Explain the types of cutters and accessories used on the machine. Discuss the use of each type of cutter and accessory.				
Genera	l Objective 2.0: Know the ope	eration of Circular Sa	aw.			
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
4-5	2.1 Discuss the uses of circular sawing machine.	Explain the uses of circular sawing machine.	Whiteboard Marker Projector	Identify the parts of circular sawing machine.	Guide students to: Identify the parts	Circular saw bench
	2.2 List the parts of circular sawing machine.	Discuss the parts of circular sawing machine.	Computer Chalk board Lesson note	Perform basic operation on the circular sawing machine.	of circular sawing machine.	Circular saw accessories
	 2.3 State the properties of materials used in making the part of the machine. 2.4 State the principles of operation of the machine. 2.5 State the basic function of the machine. 2.6 List the types of hazards related to the use of the machine. 2.7 State the potential causes of the hazards. 	Explain the properties of materials used in making the part of the machine. Elaborate the principles of operation of the machine. Explain the basic function of the machine. List the types of hazards related to the use of the machine.	Drawings/Posters	Apply necessary safety measures when using the machine. Identify the types of cutters and accessories used on the machine.	Perform basic operation on the circular sawing machine. Apply necessary safety measures when using the machine. Identify the types of cutters and accessories used on the machine.	

	 2.8 State necessary operational Precautions to be taken when using the machine. 2.9 State the types of cutters and accessories used on the machine. 2.10 Explain the use of each type of cutter and accessory of circular saw. 2.11 State necessary safety and operational precautions to be taken when using the machine. 	Explain the potential causes of the hazard. Discuss necessary operational Precautions to be taken when using the machine. Explain the types of cutters and accessories used on the machine. Discuss the use of each type of cutter and accessory. Explain necessary safety and operational precautions to be taken when using the machine.				
Genera	ll Objective 3.0: Understand t	he operation of Dime	ension saw.			
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
6-7	3.1 Discuss the uses of	Explain the uses of	Whiteboard	Identify the parts of	Guide students to:	Dimension saw.
	Dimension saw.	Dimension saw.	Marker	Dimension saw.		
			Projector		Identify the parts	Dimension saw
	3.2 List the parts of	Discuss the parts	Computer	Perform basic operation on	of Dimension saw.	accessories.
	Dimension saw.	of Dimension saw.	Posters	the Dimension saw.		
			Lesson note			

2.2 State the momenties of	Emploin the	A multiple and a second strain and factors	Perform basic	
3.3 State the properties of	Explain the	Apply necessary safety		
materials used in making the	properties of	measures when using the	operation on the	
part of the machine.	materials used in	machine.	Dimension saw.	
	making the part of			
3.4 State the principles of	the machine.	Identify the types of cutters	Apply necessary	
operation of the machine.	Elaborate the	and accessories used on the	safety measures	
	principles of	machine.	when using the	
3.5 State the basic function	operation of the		machine.	
of the machine.	machine.			
3.6 List the types of hazards	Explain the basic		Identify the types	
related to the use of the	function of the		of cutters and	
machine.	machine.		accessories used on	
3.7 State the potential causes	List the types of		the machine.	
of the hazards.	hazards related to			
3.8 State necessary	the use of the			
operational Precautions to	machine.			
be taken when using the	muennie			
machine.	Explain the			
3.9 State the types of cutters	potential causes of			
and accessories used on the	the hazards.			
machine.	the hazards.			
3.10 Explain the use of each	Discuss necessary			
	5			
type of cutter and accessory of circular saw.	operational Precautions to be			
of circular saw.				
	taken when using			
3.11 State necessary safety	the machine.			
and operational precautions				
to be taken when using the	Explain the types			
machine.	of cutters and			
	accessories used on			
	the machine.			
	Discuss the use of			
	each type of cutter			
	and accessory.			

Genera	l Objective 4. 0: Know the op	Explain necessary safety and operational precautions to be taken when using the machine.	laner			
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
8	4.1 Explain the uses of Surface Planer.	Discuss the uses of Surface Planer.	Whiteboard Marker Projector	Identify the parts of Surface Planer.	Guide the students to:	Surface planer Surface planer
	4.2 List the parts of Surface Planer.	Discuss the parts of Surface Planer.	Computer Posters Lesson note	Perform basic operation on the Surface Planer.	Identify the parts of Surface Planer.	Accessories
	4.3 State the properties of materials used in making the part of the machine.	Explain the properties of materials used in making the part of		Apply necessary safety measures when using the machine.	Perform basic operation on the Surface Planer.	
	4.4 State the principles of operation of the machine.4.5 State the basic function	the machine. Elaborate the principles of		Identify the types of cutters and accessories used on the machine.	Apply necessary safety measures when using the machine.	
	of the machine.	operation of the machine.			Identify the types	
	4.6 List the types of hazards related to the use of the machine.	Explain the basic function of the machine.			of cutters and accessories used on the machine.	
	4.7 State the potential causes of the hazards.	List the types of hazards related to				

4.8 State necessary	the use of the		
operational Precautions to	machine.		
be taken when using the			
machine.	Explain the		
	potential causes of		
4.9 State the types of cutters	the hazard.		
and accessories used on the			
machine.	Discuss necessary		
	operational		
4.10 Explain the use of each	Precautions to be		
type of cutter and accessory	taken when using		
of circular saw.	the machine.		
4.11 State necessary safety	Explain the types		
and operational precautions	of cutters and		
to be taken when using the	accessories used on		
machine.	the machine.		
	Discuss the use of		
	each type of cutter		
	and accessory.		
	Explain necessary safety and		
	operational		
	precautions to be		
	taken when using		
	the machine.		
	the machine.		

Week	Specific Learning Outcome	Teachers Activities	Learning Resources	Specific Learning Outcome	Teachers Activities	Learning Resources
	5.1 Explain the uses of	Discuss the uses of	Whiteboard	Identify the parts of	Guide students to:	Combined
	Combined Planer/	Combined Planer/	Marker	Combined Planer/		Planer/Thicknesser
)	Thicknesser.	Thicknesser.	Projector	Thicknesser.	Identify the parts	
			Computer		of Combined	Accessories
	5.2 List the parts of	Discuss the parts	Lesson note.		Planer/	
	Combined Planer/	of Combined	Wall chart/posters	Perform basic operation on	Thicknesser.	
	Thicknesser.	Planer/	Pictures	the Combined Planer/		
	5.3 State the properties of	Thicknesser.		Thicknesser.		
	materials used in making the				Perform basic	
	part of the machine.	Explain the			operation on the	
		properties of		Apply necessary safety	Combined Planer/	
	5.4 State the principles of	materials used in		measures when using the	Thicknesser.	
	operation of the machine.	making the part of the machine.		machine.		
	5.5 State the basic function			Identify the types of cutters	Apply necessary	
	of the machine.	Elaborate the		and accessories used on the	safety measures	
		principles of		machine.	when using the	
	5.6 List the types of hazards	operation of the			machine.	
	related to the use of the	machine.			- 1 - 1 - 1	
	machine.				Identify the types	
		Explain the basic			of cutters and	
	5.7 State the potential causes	function of the			accessories used on	
	of the hazards.	machine.			the machine.	
	5.8 State necessary	List the types of				
	operational Precautions to	hazards related to				
	be taken when using the	the use of the				
	machine.	machine.				

	5.0 State the trace of outton	Explain the				
	5.9 State the types of cutters and accessories used on the	potential causes of				
	machine.	the hazards.				
	machine.	the nazards.				
	5.10 Explain the use of each	Discuss necessary				
	type of cutter and accessory	operational				
	of circular saw.	Precautions to be				
		taken when using				
	5.11 State necessary safety	the machine.				
	and operational precautions					
	to be taken when using the	Explain the types				
	machine.	of cutters and				
		accessories used				
		on the machine.				
		Discuss the use of				
		each type of cutter				
		and accessory.				
		Explain necessary				
		safety and				
		operational				
		precautions to be				
		taken when using				
		the machine.				
Genera	l Objective 6.0: Know the pre	eparation and use of s	setting out rods.			
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	6.1 Define the term	Define the term-	Whiteboard	Set-out rods for common	Guide the students	
	setting out rods.	"setting out rod;	Marker	woodwork items such as	to:	
10		Route Sheet and	Projector	doors stool, kitchen unit,		
	6.2 State the steps of	Cutting list and	Computer	bookshelves, etc.	prepare rod, route	
	setting out rods in	differentiate	Lesson note		sheet and cutting	
	furniture making	between them.	Chalk Board		list to specification.	

			Posters/Drawing	Prepare route sheets for the		
	6.3 Explain the	Explain the	Posters/Drawing	production and joinery and	Guide students to	
				furniture items.	draw detailed	
	purpose of a cutting	purpose and		furniture items.		
	list.	application of			cutting list of a	
		each.		Produce setting-out rods for	particular project.	
	6.4 State the			common		
	importance of a cutting	Prepare a typical		woodwork/joinery/furniture	Demonstrate the	
	list in determining the	route sheet/cutting		items such as door,	preparation of	
	cost of a job.			bookshelves, etc. Prepare	route sheets	
		Give assignment to		cutting list for a given		
	6.5 Differentiate	student.		project		
	between setting out					
	rod, Route Sheet and					
	Cutting list					
	6.6 Explain the purpose of					
	each.					
	6.7 State the application of					
	each.					
	6.8 explain details of					
	the procedure.					
<u> </u>						
Week	al Objective 7.0: Know Band Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
week	Outcome	Activities	Resources	Outcome	Activities	Resources
	7.1 Explain the uses of	Discuss the uses of	Posters/pictures	Mount the saw blade on the	Guide the students	Narrow band saw
	band-sawing machine.	band-sawing	Lesson note	wheels correctly.	to:	
			Parts of the			Narrow band saw
		machine.	Parts of the			Natiow Datio Saw
11	7.2 List the parts of band-	machine.		Dismount the saw blade on	Mount the saw	
11	7.2 List the parts of band- sawing machine		narrow bad saw	Dismount the saw blade on the wheels correctly.	Mount the saw blade on the	Accessories
11	7.2 List the parts of band- sawing machine	Discuss the parts of band-sawing		Dismount the saw blade on the wheels correctly.		

7.3 State the properties of		Projector	Set up the machine for	Dismount the saw
materials used in making the	Explain the	Computer	various band sawing	blade on the
part of the machine.	properties		operations.	wheels correctly.
	materials used in			
7.4 State the principles of	making the part of		Use the machine for various	Set up the machine
operating the machine.	the machine.		band sawing operations.	for various band
				sawing operations.
7.5 State the basic function	Elaborate the		Carry out various cutting	
of the machine.	principles of		operations on the narrow	Use the machine
	operation of the		band saw.	for various band
7.6 List the types of hazards	machine.			sawing operations.
related to the use of the			Produce simple jig for	
machine.	Explain the basic		various band sawing	Carry out various
	function of the		operations.	cutting operations
7.7 State the potential causes	machine.			on the narrow band
of the hazards.			Use simple jig for various	saw.
	List the types of		band sawing operations.	
7.8 State necessary	hazards related to			Produce simple jig
operational Precautions to	the use of the		Calculate the length of the	for various band
be taken when using the	machine.		band saw blades.	sawing operations.
machine.				
	Explain the		Set saw blade manually.	Use simple jig for
7.9 State the types of cutters	potential causes of			various band
and accessories used on the	the hazard.		Set saw blade with	sawing operations.
machine.			sharpening machine.	
	Discuss necessary			Calculate the
7.10 Explain the use of each	operational		Sharpen saw blade	length of the band
type of cutter and accessory	Precautions to be		manually.	saw blades.
of circular saw.	taken when using			
	the machine.		Observe all operational	Set saw blade
7.11 State necessary safety			safety procedures	manually.
and operational precautions	Explain the types			
to be taken when using the	of cutters and		Sharpen saw blade with	Set saw blade with
machine.	accessories used		sharpening machine.	sharpening
	on the machine.			machine.

	Braze or butt-weld band saw	
Discuss the use of		Sharman ann hIada
	blade.	Sharpen saw blade
each type of cutter		manually.
and accessory.	Undertake routine service of	
	the narrow bad sawing	Observe all
Explain necessary	machine.	operational safety
safety and		procedures
operational	Carry out minor routine	
precautions to be	maintenance on moving	Sharpen saw blade
taken when using	parts of the machine.	with sharpening
the machine.	*	machine.
	Undertake maintain services	
	of the narrow bad sawing	Braze or butt-weld
	machine.	band saw blade.
	indefinite.	build suw blude.
		Undertake routine
		service of the
		narrow bad sawing
		machine.
		Carry out minor
		routine
		maintenance on
		moving parts of the
		machine.
		Undertake
		sawing machine.
		maintain services of the narrow bad

Week	al Objective 8.0: know CNC ro	Teachers	Learning	Specific Learning	Teachers	Learning
·· cen	Outcome	Activities	Resources	Outcome	Activities	Resources
	7.1 Explain the uses of CNC	Discuss the uses of	Posters of the	Design (decorations) on	Guide the students	CNC router
	router.	CNC router.	CNC router.	panel doors	to:	
12				1		Computer
	7.2 List the parts of CNC	Discuss the parts	Lesson note	Design decorations on beds.	Designs	1
	router.	of CNC router.			(decorations) on	
			Whiteboard	Observe safety precautions	panel doors	
	7.3 State the properties of	Explain the	Marker	when using the CNC router.	1	
	materials used in making the	properties of	Projector	C	Design decorations	
	part of the machine.	materials used in	Computer	Set the work on the	on beds.	
		making the part of		computer to align with the		
	7.4 State the principles of	the machine.		operation on the bed of the	Observe safety	
	operating the machine.	Elaborate the		ĈNC router.	precautions when	
		principles of			using the CNC	
	7.5 State the basic function	operation of the		Perform simple operation	router.	
	of the machine.	machine.		with the CNC router.		
		Explain the basic			Set the work on the	
	7.6 Explain scope of	function of the			computer to align	
	operation of the CNC router.	machine.			with the operation	
	_				on the bed of the	
	7.7 List the types of hazards	Discuss scope of			CNC router.	
	related to the use of the	operation of the				
	machine.	CNC router.			Perform simple	
					operation with the	
	7.8 State the potential causes				CNC router.	
	of the hazards.	List the types of				
		hazards related to				
	7.9 State necessary	the use of the				
	operational Precautions to	machine.				
	be taken when using the					
	machine.	Explain the				
		potential causes of				
		the hazard.				

	7.10 State the types of			
	cutters and accessories used	Discuss necessary		
	on the machine.	operational		
		Precautions to be		
	7.11 Explain the use of each	taken when using		
	type of cutter and accessory	the machine.		
	of CNC router.			
		Explain the types		
	7.12 State necessary safety	of cutters and		
	and operational precautions	accessories used		
	to be taken when using the	on the machine.		
	machine.			
		Discuss the use of		
	7.13 State materials used in	each type of cutter		
	manufacturing the parts of	and accessory.		
	the machine.	P 1 ·		
		Explain necessary		
		safety and		
		operational		
		precautions to be		
		taken when using the machine.		
		the machine.		
		Elaborate materials		
		used in		
		manufacturing the		
		parts of the		
		machine.		
Week	Examination: Practical - 7		1	
13	Enternation: Fractical /	over incorg cove		

PROG	PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FUNITURE MAKING AND UPHOLSTERY.							
Modul	e: Fundamentals o	f Machine Woodworking II		MOI	DULE CODE: CMW 12	TOTALCONTACT		
						HOURS: 240HRS		
YEAR	: 2	TERM: 1	PRE: REQUISITE:		Theoretical: 36Hours			
					Practical: 204 Hours			
Goal:				up, op	erate, maintain and repair the following	ng wood working machines:		
Mortis	ing machine, tenonii	ng machine, drilling machine	and sanding machine.					
Genera	al Objectives:							
On con	npletion of this mod	ule, the trainee should be able	e to:					
1.	Know the working	principles of a mortising mac	chine.					
2.	Know the working	principles Tenoning Machine	e.					
3.		y out various drilling machine						
4.	Know the use of po	ower tools to carry out various	s operations.					
5.	Know the operation	n of sanding machines.						
6.	Know the operation	n of a surface planer.						
7.	7. Understand Circular Sawing Machine operation.							
8.	3. Understand the processes of Carcass Construction.							
9	Know the processe	es of Frame Construction.						
10.	Know the operation	ns of an edge banding machin	e.					

PROG	PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FUNITURE MAKING AND UPHOLSTERY.								
Module	e: Fundamentals of Machine Woo	d Working II	MOUDLE CODE: CM	IW12	CONTACT 240HRS	HOURS:			
Modul	e Specification: Theoretical and P	ractical Content							
YEAR: 2TERM: 1PRE: REQUISITE:TI				eoretical: 36 Hours Practical: 204 Hours					
1. (GOAL: This module is designed to	o introduce the trainee to t	the working prin	ciples of the mortising mac	chine				
Theore	tical Content			Practical Content					
Genera	General Objective 1.0: Know the working principles of a mortising machine.								
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers		Learning		
	Outcome	Activities	Resources	Outcome	Activities	5	Resources		

1	1.1	Define mortising	Explain mortising	Whiteboard	Identify different	Guide the students to:	Mortising
		machine.	machine.	Marker	types of mortising		machine.
	1.2	List the types of		Projector	machine.	Identify different	
		mortising machine.	Discuss the types of	Computer		types of mortising	
	1.3	State the primary	mortising machine.	Drawing of a	Identify the parts of	machine.	Mortising
		function of mortising		mortising	mortising machine.		machine
		machine.	Explain the primary	machine and		Identify the parts of	accessories
	1.4	State the importance of	function of mortising	charts	Identify the clamping	mortising machine.	
		mortising machine in	machine.	showing the	devices and		
		woodworking.		various parts	attachments used on	Identify the clamping	
	1.5	List the parts of	Explain the	of the	mortising machine.	devices and	
		mortising machine.	importance of	machine.		attachments used on	
			mortising machine in		Set up the machine	mortising machine.	
	1.6	Describe the types of	woodworking.	Maintenance	for normal and		
		clamping devices and		equipment,	repetitive mortising	Set up the machine	
		attachments for the	Explain the parts of	oil, brush etc.	operation.	for normal and	
		mortising machine.	mortising machine.			repetitive mortising	
				Chalk Board	Carry out mortising	operation.	
	1.7	List the types of hazards	Elaborate the types of		operations to given		
		related to the use of the	clamping devices and	Lesson note.	specifications.	Carry out mortising	
		machine.	attachments for the			operations to given	
	1.8	State the potential causes	mortising machine.		Apply routine safety	specifications.	
		of the hazards.			and operational		
	1.9	State necessary	Explain the types of		precautions related to	Apply routine safety	
		operational Precautions	hazards related to the		the use of the	and operational	
		to be taken when using	use of the machine.		machine.	precautions related to	
		the machine.				the use of the	
	1.10	State the types of cutters	Explain the potential		Select appropriate hollow	machine.	
		and accessories used on	causes of the hazards.		chisel on a mortising		
		the machine.	Explain necessary		machine.	Select appropriate hollow	
	1.11	Explain the advantages	operational			chisel on a mortising	
		and disadvantages of	Precautions to be		Install appropriate hollow	machine.	
		each type of cutter of	taken when using the		chisel on a mortising		
		Mortising machine.	machine.		machine	Install appropriate hollow	
						chisel on a mortising	

		Discuss the types of cutters and accessories used on the machine. Discuss the advantages and disadvantages of each type of cutter of Mortising machine.			machine	
Genera	d Objective 2.0: Know the workin	g principles of Tenoning	g Machine.			
Week	Specific Learning Outcome	Teachers Activities	Learning Resources	Specific Learning Outcome	Teachers Activities	Learning Resources
2-3	 2.1 Define Tenoning Machine. 2.2 List the types of Tenoning Machine. 2.3 State the primary function of Tenoning Machine. 2.4 State the importance of Tenoning Machine in woodworking. 2.5 List the parts of Tenoning Machine. 2.6 Explain the working principles of the single end tenoning machine in its various forms. 2.7 Describe the spur cutters and state their functions. 	Explain the use of tenoning Machine. Discuss the types of Tenoning Machine. Explain the primary function of Tenoning Machine. Explain the importance of Tenoning Machine in woodworking. Explain the parts of	Mortising machine Charts Chalk board Lesson note. Whiteboard Marker Projector Computer	Identify different types of tenoning Machine. Identify the parts of tenoning Machine. Identify the clamping devices and attachments used on tenoning Machine. Set up the machine for normal and repetitive tenoning operation. Carry out tenoning	Identify different types of tenoning Machine. Identify the parts of tenoning Machine. Identify the clamping devices and attachments used on tenoning Machine. Set up the machine for normal and repetitive tenoning operation. Carry out tenoning	Tenoning machine.
	2.8 State the relationship of tenoning to mortising.2.9 Explain the purpose of balancing each pair of cutters on the machine.	Tenoning Machine. Explain the working principles of the single		operations to given specifications. Apply routine safety and operational	operations to given specifications. Apply routine safety and operational	

2.10 List the types of hazards	end tenoning machine	precautions related to	precautions related to
related to the use of the	in its various forms.	the use of the	the use of the
machine.		machine.	machine.
2.11 State the potential	Describe the spur		
causes of the hazards.	cutters and state their	Set vertical and horizontal	
2.12 State necessary	functions.	head adjustments.	Set vertical and horizontal
operational Precautions to be	State the relationship	5	head adjustments.
taken when using the	of tenoning to	Grind and sharpen	5
machine.	mortising.	mortise chisels chains.	
2.13 Explain the working	C		Grind and sharpen
principles of the single end	Explain the purpose of	Set scribing cutters to	mortise chisels chains.
tenoning machine in its	balancing each pair of	produce the mould.	
various forms.	cutters on the	1	Set scribing cutters to
2.14 List the different cutter	machine.	Adapt the machine for	produce the mould.
blocks that can be mounted		trenching.	•
on machine.	Discuss the types of	0	Adapt the machine for
2.15 State the type of job	hazards related to the	Adapt the machine for	trenching.
each cutter is best suited for	use of the machine.	square tenoning.	C .
		1 0	Adapt the machine for
	Explain the potential		square tenoning.
	causes of the hazards.		
		Set up tenoning machine	
	Explain necessary	and produce mitre tenons	
	operational	1	Set up tenoning machine
	Precautions to be	Design and produce	and produce mitre tenons
	taken when using the	suitable jig that is safe	
	machine.	for use on the machine	Design and produce
		2.8 Balance each pair	suitable jig that is safe
	Discuss the working	of cutters on the	for use on the machine
	principles of the single	tenoning machine.	2.8 Balance each pair
	end tenoning machine	-	of cutters on the
	in its various forms.	Undertake routine	tenoning machine.
		servicing and	-
	Discuss the different	maintenance on the	Undertake routine
	cutter blocks that can	machine.	servicing and

		be mounted on machine.			maintenance on the machine.	
		Explain the type of job each cutter is best suited for				
		suited for				
Genera	ll Objective 3.0: Know how to car	rv out various drilling n	achine oneratio	 ns		
	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	3.1 Define drilling machine.	Explain the use of	Drilling	Select bits suitable for	Guide the students to:	Drilling
	3.2 List the types of drilling	drilling machine.	machine	given jobs.		machine.
4	machine.		Charts		Select bits suitable for	
		Discuss the types of	Chalkboard	Mount bits correctly	given jobs.	Portable
	3.3 State the primary function of drilling machine.	drilling machine.	Whiteboard	Dismount bits correctly	Mount bits correctly	
	3.4 State the importance of	Discuss the primary				
	drilling machine in woodworking.	function of drilling machine.	Marker	Mark out work pieces for drilling operations	Dismount bits correctly	
	3.5 List the parts of drilling		Projector		Mark out work pieces for	
	Machine.	Explain the		Make simple jigs and	drilling operations	
	3.6 State the basic principle of	importance of drilling	Computer	fixtures for repetitive		
	drilling machine.	machine in		drilling operations.	Make simple jigs and	
	3.7 State major parts of drilling	woodworking.			fixtures for repetitive	
	machine. 3.8 State main functions of	Diama the sector of		Set drilling machine for	drilling operations.	
	drilling machine.	Discuss the parts of Tenoning Machine.		the following operations:	Set drilling machine for	
	3.9 Demonstrate the scope of	Tenoning Machine.		double holes.	the following operations:	
	operations of the drilling	Explain the basic		stopped or blind	➢ single holes.	
	machine.	principle of drilling		holes.	double holes.	
	3.10 State safety precautions related to drilling machines.	machine.		through holes.	 stopped or blind holes. 	
		Elaborate major parts		Carry out drilling	through holes.	
		of drilling machine.		operations to factory	0	
				specification.		

		Elaborate main			Carry out drilling	
		functions of drilling		Sharpen bits to correct	operations to factory	
		machine.		profile and keenness.	specification.	
		machine.		profile and keenness.	specification.	
		Demonstrate the scope		Replace worn belts.	Sharpen bits to correct	
		of operations of the			profile and keenness.	
		drilling machine.		Undertake routine service	-	
		_		and maintenance on the	Replace worn belts.	
		Explain safety		drilling machine.	•	
		precautions related to		C	Undertake routine service	
		drilling machines.		Select the correct size of	and maintenance on the	
		2		drill bit and fix on chuck.	drilling machine.	
					6	
				Set up drilling machine	Select the correct size of	
				and drill holes on timber	drill bit and fix on chuck.	
				accurately.		
				5	Set up drilling machine	
					and drill holes on timber	
					accurately.	
Genera	al Objective 4.0: Know the use of	power tools to carry out	various operati	ons.		
Week		Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	4.1 Define power tools.	Explain the use of	Whiteboard	Identify the parts of each	Guide the students to:	Portable
	4.2 List the types of power tools.	power tools.	Marker	potable power tools.		saw
5			Projector		Identify the parts of each	
	4.3 State the importance of	Discuss the types of	Computer	Carry out ripping	potable power tools.	Portable
	power tools in	power tools.	Portable	operation with a power		planer
	woodworking.	-	Power Tools	saw.	Carry out ripping	-
	_	Explain the	Charts	Set up power tool for	operation with a power	Portable
	4.4 List the parts of power tools.	importance of power	Chalk board	normal and repetitive	saw.	drill
		tools in woodworking.	Lesson note	operations.	Set up power tool for	
	4.5 State the function of each of				normal and repetitive	Portable
	the following power tools.	Discuss the parts of		Carry out different	operations.	sander
	 Portable power 	power tools.		operations on each of the	-	Jig saw
						- B

	 Portable power planer Portable power drill Portable power sander Jig saw Drilling machine Power router 4.6 State the advantages and disadvantages of power tools.	 Explain the function of each of the following power tools. Portable power saw Portable power planer Portable power drill Portable power sander Jig saw Drilling machine Power router State the advantages and disadvantages of power tools. 		Ripping and Mitre cutting with a power saw Surfacing and chamfering, with a planer. Stopped hole and through hole with a power drill. Sanding operation with portable sander. Cut curved surfaces with a jig saw. Groove and chamfer a with power router.	Carry out different operations on each of the power tools e.g.: Ripping and mitre cutting with a power saw Surfacing and chamfering, with a planer. Stopped hole and through hole with a power drill. Sanding operation with portable sander. Cut curved surfaces with a jig saw.	Router
					Groove and chamfer a with power router.	
Genera	l Objective 5.0: Know the operation	ion of sanding machine				
Week		Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
6	5.1 Define sanding machine.5.2 List the types of sanding machine.5.3 State the primary function of	Explain the use of sanding machine. Discuss the types of	Whiteboard Marker Projector Computer	Identify all the component parts of the overhead travelling belt sanding machine.	Guide the students to: Identify all the component parts of the	Overhead travelling belt
	 sanding machine. 5.4 State the importance of sanding machine in woodworking. 5.5 List the parts of sanding 	sanding machine. Explain the primary function of sanding machine.	Portable Power Tools Charts Chalk board Lesson note	Use the fence or the table and pressure pad.	overhead travelling belt sanding machine. Use the fence or the table	Disc sander Drum sander
	Machine.				and pressure pad.	sanuer

5 C State the basis main in the f		Catana than a share from	Cotore the second free free	
5.6 State the basic principle of	Explain the	Set up the machine for	Set up the machine for	
sanding machine.	importance of sanding	normal and repetitive	normal and repetitive	
5.7 State major parts of sanding	machine in	operations.	operations.	
machine.	woodworking.			
5.8 State main functions of				
sanding machine.	Discuss the parts of	Mount the belt on the	Mount the belt on the	
5.9 State the principles of operation of the following	sanding Machine.	overhead sander.	overhead sander.	
sanding machines:	Discuss the basic	Strain the belt correctly.	Strain the belt correctly.	
Overhead travelling belt	principle of sanding	-		
Disc and bobbing	machine.	Track the belt correctly.	Track the belt correctly.	
sanders		5		
Drum sander	Discuss major parts of	Adjust the worktable to	Adjust the worktable to	
	sanding machine.	convenient working	convenient working	
5.10 State safety and	8	height.	height.	
operational precautions related	Explain main	0	0	
to the use of the sanding	functions of sanding	carry out specific	carry out specific	
machines.	machine.	operations to factory	operations to factory	
		specifications.	specifications.	
	Explain the principles	speenieurons.	speemeentons.	
	of operation of the	Apply the belt to the face	Apply the belt to the face	
	following sanding	of the job using one of	of the job using one of	
	machines:	the following:	the following:	
	> Overhead	a. Hand pad	c. Hand pad	
	travelling belt	b. Travelling	d. Travelling	
	\blacktriangleright Disc and	pressure pad	pressure pad	
	bobbing	pressure pad	pressure pad	
	sanders	Skitch different types of	Skitch different types of	
	Drum sander			
	Drum sander	sanding machine	sanding machine	
	State safety and			
	operational			
	precautions related to			
	the use of the sanding			
	machines.			

Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	6.1 Define surface planer.	Explain the use of	Planing	Perform the following	Guide the students to:	Surface
	6.2 List the parts of surface	surface planer.	machine	operations with the		planer
7-8	planer.		Chart,	surface planer:	Perform the following	
	6.3 State the primary function of	Discuss the parts of	Chalk board,	Surfacing and	operations with the	
	surface planer.	surface planer.	Tools and	edging.	surface planer:	Surface
	6.4 State the importance of		accessories	Tapering	Surfacing and	planer
	surface planer in	Explain the primary		Chamfering	edging.	accessories
	woodworking.	function of surface	Whiteboard	\succ Through and	Tapering	
	6.5 State the basic principle of	planer.	Marker	stopped	Chamfering	
	operation of surface planer.		Projector	rebating	\succ Through and	
	6.6 Demonstrate how to plane	Explain the	Computer		stopped	
	stock to width and thickness	importance of surface		Mount cutters	rebating	
	on the thickness machines.	planer in		correctly.		
		woodworking.			Mount cutters	
		E-mlain 41 - 1 - air		Dismount cutters	correctly.	
		Explain the basic		correctly.	Dismount cutters	
		principle of operation		Plane stock to width and		
		of surface planer.		thickness on the thickness	correctly.	
		Describe how to plane		machines.	Plane stock to width and	
		stock to width and		machines.	thickness on the thickness	
		thickness on the		Grind, hone and set	machines.	
		thickness machines.		cutters.	indennies.	
		thekness machines.		cattors.	Grind, hone and set	
				Undertake routine	cutters.	
				service and		
				maintenance of the	Undertake routine	
				surface.	service and	
					maintenance of the	
				carry out specific	surface.	
				operations to factory		
				specifications.		

					carry out specific operations to factory specifications.	
	al Objective 7.0: Understand Circ			1		I
Week	Specific Learning Outcome	Teachers Activities	Learning Resources	Specific Learning Outcome	Teachers Activities	Learning Resources
9	 7.1 Define Circular Sawing Machine. 7.2 List the types of saw blade used on Circular Sawing Machine. 7.3 State the primary function of Circular Sawing Machine. 7.4 State the importance of Circular Sawing Machine. 7.5 List the parts of Circular Sawing Machine. 7.6 State the basic principle of Circular Sawing Machine. 7.7 State main functions of Circular Sawing Machine. 7.8 State the working principles of circular sawing machine. 7.9 State the specific uses of each of the following machine: > Cross cut saw. > Rip saw. > Dimension saw. 7.10 State safety precautions related to the circular sawing machine. 	Explain the use of Circular Sawing Machine. Discuss the types of saw blade used on Circular Sawing Machine. Explain the primary function of Circular Sawing Machine. Explain the importance of Circular Sawing Machine in woodworking. Explain the parts of Circular Sawing Machine. Explain the basic principle of Circular Sawing Machine. Explain the basic principle of Circular Sawing Machine. Elaborate the main functions of Circular	Circular saw machine Charts Whiteboard I.T Teaching aids Video clips P.P.E Kits Marker Projector Computer	Carry out the following operations on a circular sawing machine: - ripping stock to width - cutting stock to length - grooving - trenching - bevel cutting - miter cutting Keep the machine in good state after use.	Guide the students to: Carry out the following operations on a circular sawing machine: - ripping stock to width - cutting stock to length - grooving - trenching - bevel cutting - miter cutting Keep the machine in good state after use.	Circular sawing Machine Accessories

Conor	al Objective 8.0: Understand the p	 Explain the working principles of circular sawing machines. Explain the specific uses of each of the following machine: Cross cut saw. Rip saw. Dimension saw. Explain safety precautions related to the circular sawing machine. 				
Week		Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	8.1 Define Carcase	Explain Carcase	Models	Use hand tools to	Guide students to:	Hammer
	Construction.	Construction.		construct:		
10	8.2 List the types of saw blade		Charts	Angle joints.	Use hand tools to	
	used on Carcase	Discuss the types of		Widening joints.	construct:	Tape
	Construction.	saw blade used on	White board		Angle joints.	
	8.3 State the primary function of	Carcase Construction.		Make woodwork items	Widening joints.	Pincers
	Carcase Construction.		Markers	based on carcase		
	8.4 State the importance of	Explain the primary		construction.	Make woodwork items	Saw
	Carcase Construction in	function of Carcase	I.T Teaching		based on carcase	
	woodworking.	Construction.	aids	Carry out carcase	construction.	Try square
	8.5 List the parts of Carcase			constructions.		
	Construction.	Explain the	P.P.E Kits		Carry out carcase	Mortise
	8.6 State the basic principle of	importance of Carcase		Test carcase for	constructions.	gauge
	1 I	1				0 0
	Carcase Construction work using sketches of various	Construction in woodworking.	Projector Computer	squareness.		

joints.		Lip edges of man-made	Test carcase for	Marking
8.7 State main functions of	Discuss the parts of	boards using:	squareness.	gauge
Carcase Construction.	Carcase Construction.	Veneer, solid piece,		
8.8 State the uses of common		(plain or moulded)	Lip edges of man-made	Sliding
joins used in carcase	Explain the basic	×	boards using:	bevel
construction:	principle of Carcase	Make simple carcase	Veneer, solid piece,	
Widening joints:	Construction work	moulding.	(plain or moulded)	
➤ Butt	using sketches of			
> Dowel	various joints.	Sketch common joints	Make simple carcase	
Tongues and groove		used for carcase	moulding.	
Slot-screw joints	Explain main	construction.	C C	
Angle joints	functions of Carcase		Sketch common joints	
> Mitre	Construction.	Assemble frame of	used for carcase	
Lap joint		carcase.	construction.	
Through dovetail	Explain the uses of			
Lap dovetail	common joins used in	Test the frame for	Assemble frame of	
 Secret mitre 	carcase construction:	squareness and out of	carcase.	
> dovetail		wind.		
Intermediate Joints	Widening		Test the frame for	
Housing joint	joints:		squareness and out of	
Dovetailed- housing	▶ Butt		wind.	
joint.	> Dowel			
	Tongues and			
8.9 State the functional	groove			
requirements of joints.	➢ Slot-screw			
	joints			
8.10 State different Models of	 Angle joints 			
various joint used in carcase	Mitre			
construction.	Lap joint			
	> Through			
	dovetail			
	 Lap dovetail Second mitra 			
	 Secret mitre dovetail 			
	dovetailIntermediate			

r						r
		Joints				
		Housing				
		joint				
		Dovetailed-				
		housing				
		joint.				
		Explain the functional				
		requirements of joints.				
		requirements or joints.				
		Exhibit different				
		Models of various				
		joint used in carcase				
		construction.				
Genera	al Objective 9.0: Know the proces	ses of Frame Constructi	on			
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
11		Explain Frame	Models	Select tools for frame	Guide the students to:	Hammer
	9.2 List the types of saw blade	Construction.		installation requirements.		
				1		
	used on Frame Construction.		Charts		Select tools for frame	Таре
	used on Frame Construction. 9.3 State the primary function of	Discuss the types of	Charts	Demonstrate frame	Select tools for frame installation requirements.	Таре
	9.3 State the primary function of Frame Construction.	saw blade used on	Whiteboard		installation requirements.	Tape Pincers
	9.3 State the primary function of Frame Construction.9.4 State the importance of			Demonstrate frame		-
	9.3 State the primary function of Frame Construction.9.4 State the importance of Frame Construction in	saw blade used on	Whiteboard	Demonstrate frame installation requirements. Produce the joints using	installation requirements.	-
	9.3 State the primary function of Frame Construction.9.4 State the importance of Frame Construction in woodworking.	saw blade used on Frame Construction. Explain the primary	Whiteboard Marker	Demonstrate frame installation requirements.	installation requirements. Demonstrate frame installation requirements.	Pincers
	 9.3 State the primary function of Frame Construction. 9.4 State the importance of Frame Construction in woodworking. 9.5 List the parts of Frame 	saw blade used on Frame Construction.	Whiteboard Marker Projector Computer	Demonstrate frame installation requirements. Produce the joints using hand and machines,	installation requirements. Demonstrate frame installation requirements. Produce the joints using	Pincers
	 9.3 State the primary function of Frame Construction. 9.4 State the importance of Frame Construction in woodworking. 9.5 List the parts of Frame Construction. 	saw blade used on Frame Construction. Explain the primary	Whiteboard Marker Projector	Demonstrate frame installation requirements. Produce the joints using hand and machines, Apply hand tools	installation requirements. Demonstrate frame installation requirements.	Pincers Saw Try square
	 9.3 State the primary function of Frame Construction. 9.4 State the importance of Frame Construction in woodworking. 9.5 List the parts of Frame Construction. 9.6 State the basic principle of 	saw blade used on Frame Construction. Explain the primary function of Frame Construction.	Whiteboard Marker Projector Computer	Demonstrate frame installation requirements. Produce the joints using hand and machines, Apply hand tools correctly in accordance	installation requirements.Demonstrate frame installation requirements.Produce the joints using hand and machines,	Pincers Saw
	 9.3 State the primary function of Frame Construction. 9.4 State the importance of Frame Construction in woodworking. 9.5 List the parts of Frame Construction. 	saw blade used on Frame Construction. Explain the primary function of Frame	Whiteboard Marker Projector Computer I.T Teaching aids	Demonstrate frame installation requirements. Produce the joints using hand and machines, Apply hand tools correctly in accordance with instructions given	installation requirements.Demonstrate frame installation requirements.Produce the joints using hand and machines,Apply hand tools	Pincers Saw Try square
	 9.3 State the primary function of Frame Construction. 9.4 State the importance of Frame Construction in woodworking. 9.5 List the parts of Frame Construction. 9.6 State the basic principle of Frame Construction work using sketches of various 	saw blade used on Frame Construction. Explain the primary function of Frame Construction. Explain the importance of Frame	Whiteboard Marker Projector Computer I.T Teaching	Demonstrate frame installation requirements. Produce the joints using hand and machines, Apply hand tools correctly in accordance with instructions given for the construction of	installation requirements.Demonstrate frame installation requirements.Produce the joints using hand and machines,Apply hand tools correctly in accordance	Pincers Saw Try square Mortise gauge
	 9.3 State the primary function of Frame Construction. 9.4 State the importance of Frame Construction in woodworking. 9.5 List the parts of Frame Construction. 9.6 State the basic principle of Frame Construction work using sketches of various joints. 	saw blade used on Frame Construction. Explain the primary function of Frame Construction. Explain the importance of Frame Construction in	Whiteboard Marker Projector Computer I.T Teaching aids P.P.E Kits	Demonstrate frame installation requirements. Produce the joints using hand and machines, Apply hand tools correctly in accordance with instructions given	 installation requirements. Demonstrate frame installation requirements. Produce the joints using hand and machines, Apply hand tools correctly in accordance with instructions given 	Pincers Saw Try square Mortise
	 9.3 State the primary function of Frame Construction. 9.4 State the importance of Frame Construction in woodworking. 9.5 List the parts of Frame Construction. 9.6 State the basic principle of Frame Construction work using sketches of various joints. 9.7 State main functions of 	saw blade used on Frame Construction. Explain the primary function of Frame Construction. Explain the importance of Frame	Whiteboard Marker Projector Computer I.T Teaching aids P.P.E Kits Tools and	Demonstrate frame installation requirements. Produce the joints using hand and machines, Apply hand tools correctly in accordance with instructions given for the construction of frames.	 installation requirements. Demonstrate frame installation requirements. Produce the joints using hand and machines, Apply hand tools correctly in accordance with instructions given for the construction of 	Pincers Saw Try square Mortise gauge
	 9.3 State the primary function of Frame Construction. 9.4 State the importance of Frame Construction in woodworking. 9.5 List the parts of Frame Construction. 9.6 State the basic principle of Frame Construction work using sketches of various joints. 	saw blade used on Frame Construction. Explain the primary function of Frame Construction. Explain the importance of Frame Construction in	Whiteboard Marker Projector Computer I.T Teaching aids P.P.E Kits	Demonstrate frame installation requirements. Produce the joints using hand and machines, Apply hand tools correctly in accordance with instructions given for the construction of	 installation requirements. Demonstrate frame installation requirements. Produce the joints using hand and machines, Apply hand tools correctly in accordance with instructions given 	Pincers Saw Try square Mortise gauge Marking

joins used in Frame	Discuss the parts of	Drawings	Make sketches of framing	Sliding
construction:	Frame Construction.	_	joints	bevel
Widening joints:				
➢ Butt	Explain the basic			
➢ Dowel	principle of Frame			
Tongues and groove	Construction work			
Slot-screw joints	using sketches of			
Angle joints	various joints.			
> Mitre	-			
Lap joint	Explain main			
Through dovetail	functions of Frame			
Lap dovetail	Construction.			
Secret mitre				
dovetail	Explain the uses of			
Intermediate Joints	common joins used in			
Housing joint	Frame construction:			
Dovetailed- housing	Widening			
joint.	joints:			
	> Butt			
9.9 State the functional	Dowel			
requirements of joints.	Tongues and			
	groove			
9.10 State different Models of	➢ Slot-screw			
various joint used in Frame	joints			
construction.	Angle joints			
	> Mitre			
9.11 List factors that must be	Lap joint			
considered in frame	> Through			
construction:	dovetail			
> rigidity	Lap dovetail			
Jointing method	Secret mitre			
Squareness of frame in	> dovetail			
all	 Intermediate 			
> directions	Joints			
9.12 State the principles of	Housing			

	triangulation in relation to the rigidity of a square frame carcase.	 joint Dovetailed-housing joint. Explain the functional requirements of joints. Discuss different Models of various joint used in Frame construction. Explain factors that must be considered in frame construction: rigidity Jointing method Squareness of frame in all directions Explain the principles of triangulation in relation to the rigidity of a square frame carcase. 				
	l Objective 10.0: Know the opera					
Week		Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	10.1Define edge banding machine.	Explain the use of edge banding machine.	Posters of edge	Perform edge banding.	Guide the students to: Perform edge banding.	Edge banding machine

	10.2 State the primary function	Explain the primary	Banding	Identify all parts of the		
	of edge banding machine.	function of edge	machine.	machine.	Identify all parts of the	
		banding machine.			machine.	Compressor
	10.3State the importance of edge		Whiteboard			
	banding machine in	Explain the				
	woodworking.	importance of edge	Marker			
		banding machine in	D • 4			
	10.4List the parts of edge banding machine.	woodworking.	Projector			
		Discuss the parts of	Computer			
	10.5State the basic principle of	edge banding machine.				
	edge banding machine.	F 1 ' 4 1 '	Lesson note			
		Explain the basic				
	10.6State the function of edge	principle of edge				
	banding machine.	banding machine.				
	10.7 State the working principles	Explain the function of				
	of the edge banding machine.	edge banding machine.				
		Explain the working				
	10.8 State safety precautions to	principles of the edge				
	be observed when using the edge banding machine.	banding machine.				
		Explain safety				
		precautions to be				
		observed when using				
		the edge banding				
		machine.				
13	Examinations: Practical = 70%	• Theory - 200/				I
15	Examinations. Fractical – 70%	- 30%				

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FUNITURE MAKING AND UPHOLSTERY.								
Module: Wood and metal finishing			MODULE CODE: CPD 12		TOTAL	CONTACT		
	-				HOURS: 2	40HRS		
YEAR: 3	TERM: 1	PRE: REQUISITE:		Theoretical: 36 Hours				
				Practical: 204 Hours				
Goal: This module is de	signed to provide the trainee	with knowledge and skill to	design	, construct and finish wood and meta	l furniture ite	ems to industry		
standard.		-	-			-		
General Objectives:								
On completion of this mod	lule, the trainee should be able	e to:						
1. Understand wood	and metal finishing.							
2. Understand wood	and metal furniture design.							
	-							

PROG	PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN ENGINEERING CRAFT PRACTICE								
MODU	LE: Wood and metal finishin	g		MOUDLE CODE: CPD 12		CONTACT HOURS:			
						240 Hours			
Module	Module Specification: Theoretical and Practical Content								
YEAR:	3 TERM: 1	SITE: T	heoretical: 36 Hours						
				Practical: 204 Hours					
GOAL:	This module is designed to intr	oduce the trainee to	design, construct and	finish wood and metal furniture	items to industr	y standard.			
Theore	tical Content			Practical Content					
Genera	l Objective 1.0: Understand wo	od and metal finish	ing.						
	-		-						
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Resources			
	Outcome	Activities	Resources	Outcome	Activities				
	1.1 Discuss the layout of a	Explain how to	Charts showing	Prepare a layout sketch of a	Guide student	ts Spray equipment			
	standard spray boot and its	draw plan of a	typical workshop	standard spray boot showing	to:	such as			
	standard structural	spray painting	lay-out.	standard structural		compressor,			
	requirements such as lighting,	workshop and		requirements e.g. lighting,	draw plan of a				
1-6	types and sizes of work	mark out activity	Furniture Items for	21	spray painting				
	stations, safety installations,	areas for typical	spraying	stations, safety installations,	workshop and				
	storage facilities, etc.	operations		storage facilities, etc.	mark out activ				
			Metal sheet to be		areas for typic	cal			
			sprayed etc.		operations				

				1
1.2 Explain the layout	Explain the	XX71 · 1 1	Make outline sketches	
features of a typical low bake	characteristics of	Whiteboard	showing the layout features	Identify the
and make conveyor ovens.	various spray	Marker	of a typical low bake and	characteristics of
1.3 Explain the necessary	surfaces	Projector	make conveyor ovens.	various spray
considerations for effective	e.g. wood surface,	Computer		surfaces
spraying and describe	ferrous and non-		Identify necessary	
methods of their attainment	ferrous metal,		considerations for effective	prepare surface
e.g. pure air, adequate	fibre, etc.		spraying and describe	by using air
temperature and humility,	Enumerate the		methods of their attainment	duster, chamois
proper lighting.	sequence of		e.g. pure air, adequate	leather and
1.4 Describe how to dry	operation		temperature and humility,	masking tape
prepared surfaces by using air	involved in spray		proper lighting.	prior to
duster or chamois leather	work.		_	spraying.
1.5 Explain how to mask up			Dry the prepared surfaces by	Guide the
job prior to spray painting			using air duster or chamois	students to carry
using: (i) masking paste (ii)			leather.	out complete
masking tape(iii) masking				finishing
paper.			Mask up job prior to spray	operation on a
1.6 Describe the adjustment			painting using:(i) masking	given furniture
of :(i) material setting(ii)			paste(ii) masking tape(iii)	item using: hand
pressure S-in a spray test			masking paper.	brush; spray gun
area.				etc.
			Spray test area taking care to	
1.7 Describe the process of			adjust:(i) material setting(ii)	
preparing newly fabricated			pressure.	
and rusted (old) ferrous metal				
surfaces, aluminum alloy			Prepare newly fabricated and	
surface, glass fibre reinforced			rusted (old) ferrous metal	
plastics and resinous and oily			surfaces, aluminum alloy	
woods for spray finishing.			surface, glass fibre reinforced	
1.8 State the process of			plastics and resinous and oily	
carrying out masking			woods for spray finishing.	
operation.				
1.9 Describe the process of			Carry out masking operation.	
organizing and executing				
operations involved in			Execute operations involved	
spray finishing such as;			in spray finishing such as;	

		1	1	r		
	cellulose synthetic (half-			cellulose synthetic (half-hour		
ľ	hour enamel), acrylic			enamel), acrylic enamel and		
ľ	enamel and other classes			other classes of metallic		
ľ	of metallic paints:(i)			paints:(i) complete spray		
ľ	complete spray from bare			from bare metal(ii)		
	metal(ii) refinishing over			refinishing over an existing		
	an existing finish(iii)			finish(iii) local repair.		
	local repair.					
ľ	1.10 Describe the essential					
	operations to be carried			removal of masks,		
	out after spraying and			burnishing, polishing,		
	explain their importance			removal of over-spray,		
	e.g. removal of masks,			cleaning and refitting of parts		
	burnishing, polishing,			removed from machine,		
	removal of over-spray,			vacuum cleaning of the		
	cleaning and refitting of			interior, lining work.		
7-9	parts removed from					
ľ	machine, vacuum					
	cleaning of the interior,					
	lining work.					
Genera	I Objective 1.0: Understand wo	od and metal furnit	ure design.			
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
ľ	Outcome	Activities	Resources	Outcome	Activities	Resources
	1.11 Discuss defects in	Describe the	Tools	Spot defects in finished spray	Guide students	compressor,
10-12	finished spray work and	process of	Materials	work and explain their	to:	1 /
ľ	explain their possible causes,	carrying out	Furniture item	possible causes, preventive		cylinder
	preventive and repair	complete finishing	Equipment	and repair measures e.g.	carry out	2
	measures e.g. blistering,	work on a	Solvent.	blistering, blooming,	complete	spray guns
ľ	blooming, brushing, bridging,	furniture item	Whiteboard	brushing, bridging, cob-	finishing work	1 1 0
ľ	cob-webbing dry spray,	using hand brush;	Marker	webbing dry spray, excessive	on a furniture	
	excessive overspray, lifting,	spray gun, etc.	Projector	overspray, lifting, orange	item using hand	
	orange peel, pin-holing, runs,		Computer	peel, pin-holing, runs, sags,	brush; spray	
	sags, curtains, shelving,		*	curtains, shelving,	gun, etc.	
		1		discoloration, etc.		
	discoloration, etc.					
	1.12 Explain the final detailed					
	· · · · · · · · · · · · · · · · · · ·			Execute final detailed	perform such	

	refinishing job that is			
			Increast finishing and	
	comparable to factory		Inspect finishing and	· C
	standard.		refinishing job and cert	
	1.13 check for defects and the		that it is good enough to	0
	preventive or remedial		factory standard.	
	measures to be taken against			
	such defects in furniture		Check for defects and ta	ake
	spraying work.		preventive or remedial	
	1.14 state conditions under		measures against such	
	which defective parts of the		defects in furniture spra	lying
	spray gun should be replaced.		work.	
	1.16 Explain how to			
	dismantle a spray gun.		Identify and replace det	fective
	1.16 State the appropriate		parts of the spray gun.	
	solvent for cleaning up spray			
	gun components. State		Dismantle the gun.	
	measures to be taken to		6	
	prevent spray gun		Clean up the spray gun	
	components from rusting.		components with appro	
	1.17 Explain how to re-		solvent. Grease and oil	
	assemble spray gun		gun components to prev	
	components for storage.		rusting.	
	1.18 Explain the process off		Re-assemble spray gun	
	maintaining other tools used		components for storage	
	in spray painting.		Maintain other tools use	
	1.19 Explain the importance		spray painting.	
	of tidying up work and		Tidy up work and work	
	work		environment/premises.	
	environment/premises.		environment/premises.	
Weels		teel 700/		
Week	Examination Theory 30% Pract	lical /0%		
13				

PROGRAMME: NAT	PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FUNITURE MAKING AND UPHOLSTERY.									
MODULE: GENERAL	L METAL WORK I		MODULE CODE: CME 11		TOTAL	CONTACT				
					HOURS: 1	68 HRS				
YEAR: 1	TERM: 2	PRE: REQUISITE:		Theoretical: 48 Hours						
				Practical: 120 Hours						
Goal: This module is	s designed to introduce the	e trainee to the fundamentals of g	general	metal work processes including fitti	ng of mecha	nical parts and				
production of simple en	gineering component.									
GENERAL OBJECTI	VES:									
On completion of this m	odule the student will be a	ble to:								
1. Understand worksh	op safety rules.									
2. Know the physical	properties of metals in con	nmon use.								
3. Understand metal v	vork tools.									
4. Understand the wor	rking principles of drilling	machine.								
5. Understand the app	lication of screw threads a	nd rivets.								
6. Understand the ISC	6. Understand the ISO system of tolerances and fit.									
7. Know the Production	on process of engineering of	components.								
8. Understand the wor	rking principles of Centre-I	athe.								

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN ENGINEERING CRAFT PRACTICE								
MODU	LE: General metal wor	·k I	MOUDLE CODE: CM	MOUDLE CODE: CME 11 CONTACT				
					HOURS: 7hrs/wk			
					PER WEEK: T2, P5			
Module	e Specification: Theoretic	al and Practical Content						
YEAR:	YEAR: 1 TERM: 2 PRE: REQUISITE: 1			Theoretical: 36 Hours	Cheoretical: 36 Hours			
				Practical: 48 Hours	Practical: 48 Hours			
GOAL	: This module is designe production of simple e		to the fundamentals of	general metal work processes	including fitting o	f mechanical parts and		
Theore	tical Content			Practical Content				
GENE	RAL OBJECTIVE 1.0: U	nderstand workshop safe	ety rules.					
Week	Veek Specific Learning Teachers Learning		Specific Learning	Teachers	Learning			
	Outcome	Activities	Resources	Outcome	Activities	Resources		

1	1.1 State sources of hazards in	Explain sources of	Safety posters,	Use hand tools, portable	Guide the	First aid box
	the workshop and how to	hazards in the	common hand	power tools and machine	students to:	
	prevent them.	workshop through	tools like files	safely.		
	e.g.	questions and	hacksaw		Demonstrate	
	a handling and using hand	answers, determine		Lift, move and store	safe ways of	
	tools, portable power tools	whether the	Television, Video	materials or job carefully	handling basic	
	and machines;	students grasped	machine.		hand tools.	
	b stepping on or striking	the topic		Demonstrate first aid		
	obstructions left on floors or	*	Overall,	application in cases of	Show a film on	
	benches;	Show a film on	goggles,	minor cuts, electric shock,	industrial safety.	
	c lifting, moving and storing	industrial safety		burns.		
	materials or jobs;	through questions	gloves,		Demonstrate	
	d using inflammable or	and answers			how to treat	
	corrosive liquids and gases;	determine	hard shoes, head		energy cases like	
	e inhaling vapours or fumes;	comprehension.	shield, fire		artificial	
			extinguishers.		respiration cold	
	1.2 Explain the application of	Demonstrate how to			compress, etc	
	factory safety regulations in	treat emergency				
	the machine shop	cases like artificial				
	1.3 Name safety equipment and	respiration, cold				
	wears essential in the	compress etc.				
	machine shop, and state					
	their application in working	List the safety				
	situations.	equipment and				
	Note:	wears that are				
	Example of safety wears	essential in the				
	and equipment should	workshop.				
	include overall, eye goggles,					
	gloves, safety boots, helmet,	Give detail notes and				
	fire extinguishers, etc.	explanation in each				
	1.4 Outline safety rules and	topic a-e.				
	regulations relating to:					
	a. Clothing and health hazards;	Use questions and				
	b. Workshop hygiene;	answers to				
	c. Movement and other					

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	behaviour of workers in the	determine				
	workshops;	comprehension.				
	d. Materials handling.					
	e. Tool handling, storage and	Assess the students.				
	usage.					
	f. Machine operation.	 Give detail notes 				
	g. Fire protection.	and explanation on				
		appropriate				
	1.5 Understand appropriate	procedures to be				
	procedures in the events of a	taken in the event				
	workshop accident.	of workshop				
	1.6 Examples of procedures	accident				
	may include:					
	a application of first aid to the					
	victim;					
	b removal or rectification of					
	the accident.					
	c reporting the accident to the					
	appropriate authority.					
	1.7 keeping a record of					
	accidents for management					
	use.					
GENE	RAL OBJECTIVE 2.0: Know th	e physical properties of r	netals in common us	e.		
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	1.1 Explain the meaning of	 Give detail notes 	Video clips	Identify the following	Guide students	
	the following general	and explanations	*	metals based on their	to: Identify the	
	physical properties of	to explain the	Cassettes	properties: plain carbon	following	
	metals: - ductility,	meaning of the		steels, cast iron and alloy	metals based on	
	malleability, strength,	following general	Whiteboard	steel and state their	their properties:	
	toughness, brittleness,	physical	Marker	application in the	plain carbon	
	elasticity, plasticity.	properties of	Projector	engineering industry	steels, cast iron	
	1.2 Describe the basic	metals: ductility,	Computer		and alloy steel	
	composition and	malleability,	<u>^</u>		and state their	
	properties of plain	strength,			application in	

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	carbon steels, cast iron	toughness,		Identify the following non-	the engineering	
	and alloy steel and state	brittleness,		ferrous metals based	industry.	
	their application in the	elasticity,		on their properties:	Guide students	
	engineering industry.	plasticity. Assess		copper, tin, zinc,	to Identify	
	Note:	the students.		aluminum and	the	
	Specific examples of tools and	 Give detailed 		aluminum alloys,	following	
	equipment made from the	notes and		brass bronze, etc.	non-ferrous	
	various steel and cast iron	explanations for			metals	
	should be mentioned.	the topics in 2.1			based on	
	Examples of steels and cast	 Give notes and 			their	
	irons should include: plain	specific examples			properties:	
	carbon steels, dead mild steels,	of tools and			copper,	
	mild steel, medium carbon steel,	equipment made			tin, zinc,	
	high carbon steel.	from the various			aluminum and	
	Cast Irons - grey cast iron,	steels and cast			aluminum	
	malleable cast iron, iron carbide,	iron.			alloys, brass	
	alloy cast irons (spheroidal and	 Examples of 			•	
	acicular). Alloy Steels - high	steels and cast				
	speed steels, high tensile steels,	irons should				
	tungsten, stainless steels.	include plain				
	2.3 Outline:	carbon steels,				
	a The copula process of	dead mild steels,				
	manufacture of cast	mild steel,				
	iron;	medium carbon				
	b The blast furnace	steel high carbon				
	process of manufacture	steel, grey cast				
	of pig iron;	iron, malleable				
	c The direct reduction	cast iron, iron				
	process of manufacture	carbide, alloy cast				
	of steel.	iron, high speed				
	Note:	steels, high tensile				
	A visit to a steel	steels, tungsten,				
	manufacturing plant is	stainless steels				
	recommended.	 Give notes and 				
	recommended.	explanation on the				
		explanation on the				

· · · · · · · · ·						11
	2.4 Describe the physical	cupola process,				
	properties and applications	the blast furnace				
	of non-ferrous metals	and the direct				
	below:	reduction process				
	copper, tin, zinc, aluminum	of manufacture of				
	and aluminum alloys, brass	steel.				
	(muntz metal, cartridge	 This can be 				
	brass, gilding etc.) metal,	preceded by film				
	bronze (manganese bronze,	show and a visit				
	gunmetal, bell metal,	to be				
	aluminum bronze,	manufacturing				
	phosphor bronze and lead.	plant.				
		Give detail notes and				
		explanations describing				
		the physical properties				
		and applications of the				
		following non-ferrous				
		metals: copper, tin,				
		zinc, aluminum,				
		aluminum alloys,				
		brass, (muntz metal,				
		cartridge brass, gilding				
		metal) etc. bronze,				
		manganese bronze, bell				
		metal, aluminum				
		bronze, phosphor				
		bronze and lead.				
		Assess the students				
GENEI	RAL OBJECTIVE 3.0: Understa	and metal work tools.				
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	3.1 Explain with examples the	Prepare notes that will	Steel rule, dividers	Cary out "line" and "end"	Guide students	 Bench drill,
	difference between "line"	clearly differentiate	calipers, trammel,	measurement.	to:	pillar drill,
	and "end" measurement.		scriber, angle			drill bits

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3.2 Explain the use of datum	between "line" and	plate, vee-block,	Use datum points, datum	Cary out "line"	 Bench drill,
points, datum lines and	"end" measurement.	Centre square.	lines, and datum faces in	and "end"	pillar drill,
datum faces in marking			marking out.	measurement.	twist drill,
out.	Prepare notes and	Micrometer		Use datum	flat drill,
3.3 Describe, the functions	examples that will	Vernier calipers	Demonstrate, the functions	points, datum	counter sink
and application of the	explain the use of	Vernier height	and application of: steel	lines, and datum	drill,
following instruments used	datum points, datum	gauge combination	rule, dividers, calipers	faces in marking	counterbore
in metal-work; steel rule,	lines, and datum faces	set	(inside, outside and	out.	drill, center
dividers, calipers (inside,	in marking out.		oddleg) trammel, scriber,		drill
outside and odd-legs),		Flat file, hard file,	angle plate, vee-block,	Demonstrate, the	 Drills, taps,
trammel, scriber angle	Demonstrate, give	round file square,	Centre square in marking	functions and	tap wrench,
plate, vee-block, Centre	detailed notes and	half round,	out	application of:	die and die
square.	explanations regarding	triangular warding,	Classify the common files	steel rule,	stock
3.4 Describe the various types	the functions and	mill file, rasp file.	used in the metal work.	dividers, calipers	 Rivets and
of files, stating their grades	application of: steel			(inside, outside	sets of drill
and applications.	rule, dividers, calipers	Flat file, hand file	Show a bench vice and	and oddleg)	bits
Note:	(inside, outside and	engineers square.	demonstrate holding of the	trammel, scriber,	Surface table,
Types of files should include:	oddleg) trammel,		work in a vice for filing,	angle plate, vee-	surface plate,
flat, square, round, half round,	scriber, angle plate,	Surface plate try	tapping and designing	block, Centre	marking
three square, warding pollar,	vee-block, Centre	square (engineers	operations.	square in	solution,
mill and rasp.	square	square)		marking out	center/dot
3.5 Classify the common files					punches,
use in metal work and	Prepare notes that will	Bench vice.		Classify the	scribing block
state their composition of	describe the various			common files	
material used for their	types of files stating	Ball pein hammers		used in the metal	
manufacture.	their grades and	mallets.		work.	
3.6 Sketch the bench vice,	applications. By type it	Cold chisels,			
explain its clamping power	means: flat, square	Centre punches,		Show a bench	
and demonstrate the	round, half round, three	dot punch,		vice and	
technique of holding work	square, warding, mill	scrapers, power		demonstrate	
in the vice for filing,	and rasp.	hacksaw and		holding of	
tapping and designing	_	blades.		work piece in a	
operations.	Prepare detail notes			vice for filing,	
3.7 Describe the functions of	that will classify the	Hacksaw blade		tapping and	
the various parts of a bench	common files used in				

vice.	, its holding power	the metal work as well	Hacksaw frame	designing	
	e performing various	as stating the		operations.	
	ations on its, such as	composition of	Adjustable	1	
	g, tapping sawing etc.	materials used for their	hacksaw junior		
	cribe and use the	manufacture.	hacksaw piercing		
	wing tools:		saw.		
a	e e	Show a bench vice and			
	(flat, cross, cut	demonstrate the work			
	half round,	in the vice for filing,			
	diamond-point)	tapping and designing			
b		operations.			
	and dot punch	1			
c	. scrappers (flat,	Prepare detailed notes			
	triangular half	that will describe the			
	round)	functions of the various			
d	. power hack	parts of a bench vice,			
saw		its holding power while			
	ribe the various parts	performing various			
	hack saw and their	operations.			
func					
	cribe the common	Assess the students.			
• •	s of hacksaw blades,				
	range of pitches and	Prepare detailed notes			
	applications.	and demonstrations			
-	w a bench vice and	that will describe the			
	onstrate the technique	uses of: cold chisels,			
	olding work in the vice	Centre punch, dot			
	iling, tapping and	punch, scrapers and			
	gning operations.	power hacksaw.			
	are detailed notes that	D (1)			
	describe the functions	Prepare notes that will			
	e various parts of a	describe the various			
	h vice, its holding	parts of a hacksaw and			
	er while performing	their functions.			
vario	ous operations.				

3.13 State the safety precautions to be observed when using a hand hacksaw	Show samples of hacksaw blades as well as prepare notes that will describe the common types of hacksaw blades, their range of pitches and their applications.		
	Prepare notes that will show correct way of inserting blades. Prepare detail notes		
	and explanation, stating the safety		
	precautions to be observed when using a		
	hand hacksaw. Prepare notes that will describe the uses of		
	various hacksaws. Assess the students		

Week	Specific Learning	Teachers	Learning		Teachers	Learning
	Outcome	Activities	Resources		Activities	Resources
	4.1 Identify the various	Describe different types	Bench drill	Identify the various types of	Guide students to:	Point tools,
	types of drilling	of drilling machines	Pillar drill.	drilling machines.	Identify the	grinding
	machines.	_		Sketch and label the main	various types	machine, lathe
	4.2 Describe the main	Describe the main	Twist drill,	features of a bench or pillar	of drilling	machine
	features of a bench	features of a bench or	flat drill	drilling machine.	machines.	
		pillar drilling machine.	counter sink drill			

	or pillar drilling	F 1 · 1 · 1 · 1	. 1 1 11	Use the following drills for	Sketch and label	3-jaw chuck and
	machine.	Explain describe where	counter bore drill	different operations.	the main features	lathe machine
4.3		each of the following	combination	e.g. twist drill (taper	of a bench or	
	the following types	drills are best suited		shank, parallel shank	pillar drilling	Point tools lathe
	of drills are best		Centre drill.	and jobbers drill, and	machine.	machine
	suited.	Twist drill (taper shank,		their relative merits),	Use the following	
	e.g. twist drill (taper	parallel shank, jobber	Ball pein hammers	flat drill, countersink	drills for	Lathe machine
	shank, parallel shank	drill and their relative		drill, counter bore	different	and accessories
	and jobbers drill,	merits), flat drill,	mallet, cold chisels,	drill, combination	operations.	
	and their relative	counterbore drill and	dot/center punches,	Centre drill.	e.g. twist	Centre lathe and
	merits), flat drill,	combination center drill.	hacksaw and	Perform reaming operation	drill (taper	accessories like
	countersink drill,	Explain the effects of the	hacksaw blades	to given specification	shank,	catch plate, face
	counter bore drill,	following faults in a		by hand and machine	parallel	plate, dog lathe,
	combination Centre	ground twist drill	Drilling machines	method.	shank and	lathe centers
	drill.	bit:	and its accessories.		jobbers drill,	fixed steady and
4.4		a. point angle too			and their	traveling steading
	the following faults	acute.			relative	
	in a ground twist	b. point angle too			merits), flat	Round nose
	drill bit:	obtuse.			drill,	turning tool, fine
	a. point angle too	c. cutting edges at			countersink	finishing tool,
	acute.	unequal angles.			drill, counter	form tool, parting
	b. point angle too	d. insufficient lip			bore drill,	off tool, drilling
	obtuse.	clearance			combination	tool, bar of good
	c. cutting edges at	e. excessive lip			Centre drill.	length and 4mm
	unequal angles.	clearance.			Perform reaming	diameter,
	d. insufficient lip	Explain how			operation to given	Live/dead centers
	clearance	Calculate spindle			specification by	catch plates
	e. excessive lip	revolution or cutting			hand and machine	Standard
	clearance.	speed for specified			method.	exercises or
4.5	Explain how to	size of drill using the				prepared
	calculate spindle	formulae:-				exercises.
	revolution or cutting					
	speed for specified	Explain the cause and				
	size of drill using the	remedy of drilling				
	formulae:-	faults such as:-				

		1 .11 1 1 .				1
		e. drill breaking;				
	4.6 State the cause and	f. drill coloured				
	remedy of drilling	blue;				
	faults such as:-	g. walls of drilled				
	a. drill breaking;	hole left rough;				
	b. drill coloured	h. chipped cutting				
	blue;	lips.				
	c. walls of drilled					
	hole left rough;	Explain the safety				
	d. chipped cutting	precautions to be				
	lips.	observed when using a				
	4.7 State the safety	drilling machine.				
	precautions to be	Explain the purpose of				
	observed when	reaming and				
	using a drilling	describe different				
	machine.	types of hand and				
	4.8 State the purpose of	machine reamers.				
	reaming and	Explain how to ream to				
	describe different	given specification by				
	types of hand and	hand and machine				
	machine reamers.	method.				
	4.9 state the process of					
	reaming to a given					
	specification by					
	hand and machine					
	method.					
	l Objective 5.0: Understa		w threads and rivet.		•	
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	5.1 Describe the thread	Describe the various	Diagrams/charts of	Sketch various forms of	Gude students to:	Taps, tap wrench,
	forms below and	forms of thread and their	thread forms	thread.	Sketch various	stock .and dies
	state their	uses.			forms of thread.	
	applications:-		Parallel reamers	Identify taps, tap wrench,		
	a the ISO metric		taper reamers twist	die and die stock .		
	thread		drills.			

 				7.4 1.0	
b the unified thread	Explain the functions of		Use tap and tap wrench to	Identify taps, tap	
c Whitworth and	taps, tap wrench, die and	Rivet sets	produce internal and	wrench, die and	
British fine	die stock .		external threads.	die stock .	
threads	Explain how to produce	Whiteboard			
d British	internal and external	Marker		Use tap and tap	
Association	threads.	Projector		wrench to	
(BA) thread	Explain tapping size or	Computer		produce	
e British Standard	tapping drill and estimate	1		internal and	
pipe	its values using the			external	
f Square thread	formula:			threads	
g Acme thread					
h Buttress thread.	T = D - P				
5.2 State the functions					
of:-	Where T = tapping				
a taps (taper tap,	diameter				
second tap,	D = thread top diameter				
plug)	and				
b tap wrench	P = Pitch				
c die and die stock.	$\Gamma = \Gamma$ licit				
5.3 State the meaning of	Explain different types				
tapping size or	of rivets, rivet sets, and				
tapping drill and	their uses and how to				
estimate its value in	calculate the diameter of				
given situations	rivet and riveting				
using formulae such	allowance.				
as:-					
T = D - P					
Where T =					
tapping diameter					
D = thread					
top diameter					
$\mathbf{P} = \mathbf{pitch}$					
5.4 State precautions to					
be taken when					
taping on the bench.					

	5.5 Describe and						
	differentiate						
	types of rivets.						
	e.g. Snap and pan						
	head, mushroom						
	and counter-sunk						
	head, flat head,						
	dod rivet, etc.						
	5.6 Sketch the rivet						
	set and state its						
	use.						
	5.7 Calculate the						
	diameter of rivet and						
	riveting allowance						
C	in given situations.	1 4h - 160					
Week	General Objective 6.0: Understand the ISO system of tolerances and fits.WeekSpecific LearningTeachersLearningSpecific LearningTeachersLearning						
week	Specific Learning Outcome	Activities	Learning Resources	Specific Learning Outcome	Teachers Activities	Learning Resources	
	6.1 Differentiate	Give detailed notes that	Whiteboard	Outcome	Activities	Resources	
	between the	will differentiate	Marker				
	between the	will differentiate	Warker				
	fall arriver	hater an anning the	Dusiantan				
	following:-	between nominal size,	Projector				
	a nominal size	between nominal size, limits, tolerance and fits.	Projector Computer				
	a nominal size b limits (upper and	limits, tolerance and fits.	Computer				
	a nominal size b limits (upper and lower)	limits, tolerance and fits. Prepare detailed note and	Computer Charts on				
	 a nominal size b limits (upper and lower) c tolerance 	limits, tolerance and fits. Prepare detailed note and diagrams that will	Computer Charts on tolerances, limits				
	 a nominal size b limits (upper and lower) c tolerance (unilateral and 	limits, tolerance and fits. Prepare detailed note and diagrams that will explain the important of	Computer Charts on				
	 a nominal size b limits (upper and lower) c tolerance (unilateral and bilateral) 	limits, tolerance and fits. Prepare detailed note and diagrams that will explain the important of tolerance and fits in	Computer Charts on tolerances, limits				
	 a nominal size b limits (upper and lower) c tolerance (unilateral and bilateral) d fit (clearance, 	limits, tolerance and fits. Prepare detailed note and diagrams that will explain the important of tolerance and fits in engineering production	Computer Charts on tolerances, limits				
	 a nominal size b limits (upper and lower) c tolerance (unilateral and bilateral) d fit (clearance, transition 	limits, tolerance and fits. Prepare detailed note and diagrams that will explain the important of tolerance and fits in engineering production as well as describing the	Computer Charts on tolerances, limits				
	 a nominal size b limits (upper and lower) c tolerance (unilateral and bilateral) d fit (clearance, transition interference). 	limits, tolerance and fits. Prepare detailed note and diagrams that will explain the important of tolerance and fits in engineering production as well as describing the ISO systems of limits	Computer Charts on tolerances, limits				
	 a nominal size b limits (upper and lower) c tolerance (unilateral and bilateral) d fit (clearance, transition interference). 6.2 Explain the 	limits, tolerance and fits. Prepare detailed note and diagrams that will explain the important of tolerance and fits in engineering production as well as describing the	Computer Charts on tolerances, limits				
	 a nominal size b limits (upper and lower) c tolerance (unilateral and bilateral) d fit (clearance, transition interference). 6.2 Explain the importance of 	limits, tolerance and fits. Prepare detailed note and diagrams that will explain the important of tolerance and fits in engineering production as well as describing the ISO systems of limits and fits.	Computer Charts on tolerances, limits				
	 a nominal size b limits (upper and lower) c tolerance (unilateral and bilateral) d fit (clearance, transition interference). 6.2 Explain the importance of tolerance and fit 	limits, tolerance and fits. Prepare detailed note and diagrams that will explain the important of tolerance and fits in engineering production as well as describing the ISO systems of limits and fits. Give notes and	Computer Charts on tolerances, limits				
	 a nominal size b limits (upper and lower) c tolerance (unilateral and bilateral) d fit (clearance, transition interference). 6.2 Explain the importance of 	limits, tolerance and fits. Prepare detailed note and diagrams that will explain the important of tolerance and fits in engineering production as well as describing the ISO systems of limits and fits.	Computer Charts on tolerances, limits				

	1					
	describe briefly	amount of tolerance and				
	the ISO system	types of fits in given				
	of limits and fits.	situations.				
	6.3 Determine by	Assess the students.				
	calculation the amount of					
	tolerance and types of fit					
	in given situations.					
Genera	l Objective 7.0: Know the	Production process of Eng	gineering Components	5		
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	7.1 Explain layout	Teachers to prepare	Lesson notes			
	procedures from	notes and explanations to				
	working drawing of	guide the students in	Diagrams			
	simple engineering	producing simple	0			
	components or tools	engineering components	charts.			
	such as:-	as in 7.1				
	a open ended		Whiteboard			
	spanner	Assess the students.	Marker			
	b engineer's try		Projector			
	square		Computer			
	c tool maker's		e emp ater			
	clamp					
	d plate bracket or					
	gusset					
	(involving					
	rounds, angles,					
	holes)					
	e Centre square.					
	7.2 Explain how to					
	produce any simple					
	engineering					
	component to given					
	specifications					
	including					
	dimensions,					
	unitensions,					

	t	tolerance and finish					
		Explain how to carry					
		out simple precision					
		fitting project. e.g.					
		hexagonal mild steel					
		bar making push fit					
		through a mild steel					
		plate.					
Genera	l Obje	ctive 8.0: Understan	d the working principles o	f the Centre lathe.			·
X7 I	0	· C T ·	T 1	T •	а •е•т •	T	
Week		ific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outc		Activities	Resources	Outcome	Activities	Resources
	-	Describe the essential features of	Prepare detailed notes that will describe the	Centre lathe and accessories like			
		a Centre lathe and	essential features of	catch plates, face			
		state their functions	center lathe and their	plates, centers, fixed			
		e.g. lathe bed,	functions.	and traveling			
		headstock, tailstock,	runctions.	steadies.			
		saddle or carriage,	Give notes and diagrams	steadles.			
		etc.	that will explain the	Charts of center			
		Explain the working	working principles of	lathe and capstan			
		principles of the	center lathe and	lathe.			
		Centre lathe.	functions of its				
	8.3 I	dentify and state the	accessories.	Round nose turning			
		functions of Centre		tool, finishing tool,			
	1	lathe accessories	Give explanations that	site finishing, knife			
	S	such as: catch or	will show the difference	tool, form tool,			
		driving plate, face	between center lathe and	parting off tool, and			
		plate, lathe dog or	capstan lathe in terms of	drilling tool.			
		carrier, lathe centers,	their main features and				
		fixed and travelling	functions.	Charts on tool			
		steadies.		height			
		Explain the	Prepare notes that will				
		difference between	list types of cutting fluid	Charts and diagrams			
	t	the Centre lathe,	used for lathe turning	of different			

capstan lathe, in terms, of their main features and functions.operations and their operations.machining operations.8.5Name types of functions.Prepare detailed notes and explanation that will outline safetyindexplanation that will outline safetyindexplanation that will outline safetyoperations and state and precautions, common their composition and precautions, common tools and materials used and purposes.in marking them.8.6Guttine safetyin marking them.9precautions to be diagrams that will working on the lath tuped tool, bit and tuped tool, bit and holder.Give detailed notes tool angles, (rake, common tools: e.g. butt-brazed tool, values for different tuped tool, bit and holder.Give notes and diagrams tool angles, (rake, common tools: e.g. butt-brazed tool, values for different tuped tool, bit and holder.Give notes and diagrams of various tool shapes of various tool shapes and their uses.in dutie uses.7Tool description and their uses.Give notes and diagrams of various tool shapes and their uses.in dutie uses.8precation stoel, high speed steel, stellite, cemented carbide, stellite, recented carbide, speed steel, stellite, recented carbide, speed steel, stellite, recented carbide,in dutie uses.	 . 1.1	. 1.1 :	1 • •		
features and functions.purposes.8.5Name types of cutting fluids used and explanation that will 			e		
functions.Prepare detailed notes and explanation that will outline safety precautions to be observed when working on the lath common tools: e.g. butt-brazed tool, tipped stol, bit and holder.Prepare detailed notes and explanation that will outline safety grecautions to be common tools: e.g. butt-brazed tool, topped stol, bit and holder.Note:Assess the students. Tool description should include toolNote:Assess the students. of various tool shapes and their uses. and their uses.		•	operations.		
8.5 Name types of cutting fluids used for lathe turning operations and state their composition and purposes.Prepare detailed notes and explanation that will outline safety precautions, common tools and materials used in marking them.8.6 Outline safety precautions to be observed when working on the lath tipped tool, bit and holder.Give detailed notes and diagrams that will explain the functions of tool angles, (rake, common tools: e.g. butt-brazed tool, tipped tool, bit and holder.Give notes and diagrams of various tool shapes and their uses.Note: Tool description should include tool materials e.g. plain carbon steel, high speed steel, stellite,Give notes and diagrams of various tool shapes and their uses.		purposes.			
cutting fluids used for lathe turning operations and state their composition and purposes.and explanation that will outline safety precautions, common tools and materials used in marking them.8.6 Outline safety precautions to be observed when working on the lath Explain the functions of tool angles, (rake, common tools: e.g. butt-brazed tool, bit and holder.Give detailed notes and diagrams that will explain the functions of tool angles, (rake, clearance) stating their values for different metals to be machined.Note: Note:Assess the students.Tool description should include tool materials e.g. plain carbon steel, high speed steel, stellite,Give notes and diagrams of various tool shapes and their uses.					
for lathe turning operations and state their composition and purposes.outline safety precautions, common tools and materials used in marking them.8.6 Outline safetyprecautions to be observed when working on the lathGive detailed notes and diagrams that will explain the functions of tool angles, (rake, common tools: e.g. butt-brazed tool, tipped tool, bit and holder.clearance) stating their walues for different metals to be machined. holder.Note:Assess the students.Tool description should include tool materials e.g. plain of various tool shapes arbon steel, high speed steel, stellite,Give notes and diagrams of various tool shapes and their uses.	2 1				
operations and state their composition and purposes.precautions, common tools and materials used in marking them.8.6 Outline safety precautions to be observed when working on the lath working on the lathGive detailed notes and diagrams that will explain the functions of tool angles, (rake, clearance) stating their values for different metals to be machined.8.7 Sketch and describe common tools: e.g. butt-brazed tool, tipped tool, bit and holder.clearance) stating their values for different metals to be machined.Note: Tool description should include tool materials e.g. plain carbon steel, high speed steel, stellite,Give notes and diagrams of various tool shapes and their uses.					
their composition and purposes.tools and materials used in marking them.8.6 Outline safety precautions to be observed when working on the lath ecommon tools: e.g. butt-brazed tool, tipped tool, bit and holder.Give detailed notes and diagrams that will eclearance) stating their values for different metals to be machined.Note: Tool description should include tool materials e.g. plain carbon steel, high speed steel, stellite,Give notes and diagrams of various tool shapes and their uses.	for lathe turning	outline safety			
and purposes.in marking them.8.6 Outline safetyGive detailed notes and diagrams that willprecautions to be observed whenGive detailed notes and diagrams that willworking on the lath explain the functions of tool angles, (rake, common tools: e.g. butt-brazed tool, tipped tool, bit and holder.evalues for different metals to be machined.Note:Assess the students.Tool description should include tool materials e.g. plain carbon steel, high speed steel, stellite,Give notes and diagrams of various tool shapes and their uses.	operations and state				
8.6 Outline safety Give detailed notes and diagrams that will working on the lath explain the functions of tool angles, (rake, clearance) stating their 8.7 Sketch and describe common tools: e.g. butt-brazed tool, tipped tool, bit and holder. Note: Assess the students. Tool description should include tool materials e.g. plain carbon steel, high speed steel, stellite, Give notes and diagrams of various tool shapes and their uses.	their composition	tools and materials used			
precautions to be observed when working on the lath 8.7Give detailed notes and diagrams that will explain the functions of tool angles, (rake, common tools: e.g. butt-brazed tool, tipped tool, bit and holder.Give and fifterent metals to be machined. holder.Note:Assess the students.Tool description should include tool materials e.g. plain carbon steel, high speed steel, stellite,Give notes and diagrams of various tool shapes and their uses.	and purposes.	in marking them.			
observed when working on the lathdiagrams that will explain the functions of tool angles, (rake, clearance) stating their values for different8.7Sketch and describe common tools: e.g. butt-brazed tool, tipped tool, bit and holder.clearance) stating their values for different metals to be machined.Note:Assess the students.Tool description should include tool materials e.g. plain carbon steel, high speed steel, stellite,Give notes and diagrams and their uses.	8.6 Outline safety				
working on the lathexplain the functions of tool angles, (rake, common tools: e.g.explain the functions of tool angles, (rake, clearance) stating theirbutt-brazed tool,values for differenttipped tool, bit and holder.metals to be machined. holder.Note:Assess the students.Tool description should include tool materials e.g. plain carbon steel, high speed steel, stellite,Give notes and diagrams and their uses.	precautions to be	Give detailed notes and			
8.7 Sketch and describe common tools: e.g. tool angles, (rake, butt-brazed tool, values for different tipped tool, bit and metals to be machined. holder. Assess the students. Tool description Give notes and diagrams should include tool Give notes and diagrams materials e.g. plain of various tool shapes and their uses. and their uses.	observed when	diagrams that will			
common tools: e.g. butt-brazed tool, tipped tool, bit and holder.clearance) stating their 	working on the lath	explain the functions of			
butt-brazed tool, tipped tool, bit and holder.values for different metals to be machined.Note:Assess the students.Tool description should include tool carbon steel, high speed steel, stellite,Give notes and diagrams of various tool shapes and their uses.	8.7 Sketch and describe	tool angles, (rake,			
tipped tool, bit and holder.metals to be machined.Note:Assess the students.Tool description should include toolGive notes and diagrams of various tool shapes and their uses.carbon steel, high speed steel, stellite,of various tool shapes and their uses.	common tools: e.g.	clearance) stating their			
Index.Assess the students.Note:Assess the students.Tool descriptionGive notes and diagramsshould include toolGive notes and diagramsmaterials e.g. plainof various tool shapescarbon steel, highand their uses.speed steel, stellite,Image: Carbon steel, stellite,	butt-brazed tool,	values for different			
holder.Assess the students.Note:Assess the students.Tool descriptionGive notes and diagramsshould include toolGive notes and diagramsmaterials e.g. plainof various tool shapescarbon steel, highand their uses.speed steel, stellite,Image: Carbon steel, stellite,	tipped tool, bit and	metals to be machined.			
Tool description should include tool materials e.g. plain carbon steel, high speed steel, stellite,Give notes and diagrams of various tool shapes and their uses.	holder.				
should include tool materials e.g. plain carbon steel, high speed steel, stellite,Give notes and diagrams of various tool shapes and their uses.	Note:	Assess the students.			
should include tool materials e.g. plain carbon steel, high speed steel, stellite,Give notes and diagrams of various tool shapes and their uses.	Tool description				
materials e.g. plain carbon steel, high speed steel, stellite,of various tool shapes and their uses.	*	Give notes and diagrams			
carbon steel, high and their uses. speed steel, stellite,	materials e.g. plain				
speed steel, stellite,					
		Prepare detailed notes			
diamond. and explanations to					
8.8 Explain with sketches cover 8.10 to 8.15	8.8 Explain with sketches				
the functions of tool	A				
angles (rake, Solve many problems for		Solve many problems for			
clearance), and state the students practice.					
their values for		1			
different metals to Assess the students		Assess the students			
be machined.					

8.9 Differentiate				
between vario				
shapes and sta	te			
their uses e.g.				
Round nose roughe				
finishing, side finis				
knife tool, form too	l,			
parting off tool, dri	lling			
tool, etc.				
8.10 Explain with				
sketches the et	ffects			
of wrong settin	ng of			
cutting tool: e.				
vibration and				
chatter, tool ru	lbbing			
against or dig				
into the job.				
8.11 Define cutting	speed			
and feed with	1			
respect to lathe	e			
operation.				
8.12 Calculate the c	cutting			
speed and feed				
given turning				
operation.				
8.13 Estimate the ra	ate of			
metal removal				
time required				
carrying out				
specified turni	nσ			
operations				
8.14 State precaution	onsto			
be observed w				
turning betwee				
centers'.	-11			
centers.			l	

	8.15 Set up the lathe for			
	and carry out basic			
	turning operations			
	between centers.			
	8.16 Compute required			
	taper dimensions			
	from given data			
	using taper ratio			
	angle formulae i.e.			
	Taper Ratio = $d2 - d1$			
	Taper Ratio $-\frac{d2 - d1}{I}$			
	OR			
	$\underline{\mathrm{Tan}\theta} = \underline{\mathrm{d}2-\mathrm{d}1}$			
	2			
	where $\underline{\theta}$ = taper angle			
	d1 - small end diameter			
	d2 = large end diameter			
	L = length of taper			
Week				
13				

PROGRAMME: NATIO	PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FUNITURE MAKING AND UPHOLSTERY.									
MODULE: GENERAL	METAL WORK II		MODULE CODE: CME 12		TOTAL CONTACT					
					HOURS: 240HRS					
YEAR: 2	TERM: 1	PRE: REQUISITE:		Theoretical: 36 Hours						
				Practical: 48 Hours						
Goal: This module is de	Goal: This module is designed to introduce the trainee to basic processes in mechanical engineering such as forging, sheet-metal work and welding.									
GENERAL OBJECTIV	ES:									
On completion of this mod	lule, the trainee should	d be able to:								
1. Understand heat the	reatment of metal.									
2. Know the Product	ion of engineering co	mponents by forging.								
3. Understand the pr	ocess of gas and meta	l arc welding.								

PROG	RAMME: NATIO	NAL TECHNICAL CH	ERTIFICATE IN	FUNITURE	MAKING AND UPHOI	STERY	Υ.			
MODU	LE: GENERAL N	IETAL WORK II			MODULE CODE: CM	E 12 (CONTACT I	HOURS: 2hrs Theory;		
					1Hr. Practical/Wk.					
YEAR:	2 TERM:	1 PRE: REQUIS	ITE:	Theoretical	retical: 36 Hours					
					: 48 Hours					
Goal: This module is designed to introduce the trainee to basic processes in mechanical engineering such as forging, sheet-metal work and welding.										
Theoretical Content Practical Content										
GENEI	GENERAL OBJECTIVE: 1.0 Understand heat treatment of metal.									
	1	T				•				
Week	Specific	Teachers	Learning		Specific Learning		chers	Learning		
	Learning	Activities	Resources		Outcome	Acti	ivities	Resources		
	Outcome									
	1.1 Explain	Prepare detail notes	Recommended 7	Fextbooks	Carry out the following	Guide	the students	Furnace		
1-2	briefly the	that will explain the			heat treatment	to:				
	structural	structural behaviour	Lesson notes		processes Hardening,			Forge tongs		
	behaviour of	of Plain Carbon Steel			tempering, annealing,	Demor	nstrate heat			
	Plain Carbon	as it is heated from	Whiteboard		normalizing, case	treatme	ent			
	Steel as it is	temperature to about	Marker		hardening on given	·	ses and			
	heated from	1000°C	Projector		plain carbon steel,	explair	n the stages			
	room		Computer		engineering component					
	temperature				or tool.					

	4 1 4	D				Demonstrate 41	
	to about	Prepare detail notes		A 1	1	Demonstrate the	
	1000°C	that will explain the			pper, brass	annealing process	
	a. Hardening	meaning of		and alumi		on brass, copper	
	b. Tempering	hardening in metal		various pu	irposes	and aluminum for	
	c. Annealing	work				various purposes.	
	d. Normalizing						
	e. Case-hardening					Assess the	
		Prepare notes that				students.	
	1.2 Explain the	will outline safety					
	meaning of	precautions relating					
	hardening	to heat treatment					
	metal work.	processes.					
	Outline safety						
	precautions						
	relating to heat	Assess the students.					
	treatments						
	processes and						
	apply them to						
	given situations.						
Genera	l Objective 2.0: Kr	ow the Production of	Engineering Components by F	orging.			
Week	Specific	Teachers	Learning	Specific L	earning	Teachers	Learning
	Learning	Activities	Resources	Outcome	_	Activities	Resources
	Outcome						
5-6	2.1 Explain with	Prepare detail notes	Diagrams of Forges	Select app	ropriate	Guide the students	Anvil, swage block, leg
	outline sketch the	and diagrams that		forging to	ols and	to:	vice, forging hammers,
	main features and	will explain the main	Forging tools.		specification		hot set, cold set, sets of
	working	features and working	0.0	given engi	ineering	Demonstrate with	hammer, punchers,
	principles of the	principles of the	Whiteboard		ts by forging	appropriate	drifts, fillers, top
	blacksmith's	Blacksmith's forge.	Marker	processes		forging tools how	swage, bottom swage,
	forge.	Prepare notes and	Projector	1	Upsetting –	to produce some	flatter, open tongs,
	2.2 Describe and	diagrams that will	Computer		drawing down	engineering	hallow bit
	state the	describe the	1		Setting down	components and	
	functions of	functions of common			- twisting	let the student	
	common forging	forging tools.			Forge	practice till they	
	tools, e.g. anvil,	5 5			welding (scarf	become competent	

		D 1.1				1
	swage block, leg	Prepare detail notes		and spice		
	vice,	that will describe the		welds)	Assess the	
	forging hammers,	following forging	d.	Bending,	students	
	hot and cold sets,	operations: upsetting,		turning closed		
	set hammer,	drawing down,		ring		
7-8	punches and	setting down,	Forming	g an eye		
	drifts, hardie,	twisting, forge				
	fullers, top and	welding, bending,				
	bottom swages,	forming closed ring				
	flatter, tongs	and forming an eye.				
	(open mouth,					
	closed mouth,	Assess the students.				
	hollow bit, etc.)					
	2.3 Describe					
	using sketches					
	the following					
	forging					
	operations:					
	a. Upsetting					
	b. Drawing					
	c. Setting					
	down					
	d. Twisting					
	e. Forge					
	welding (scarf					
	and splice					
	welds)					
	f. Bending					
	g. Forming					
	closed ring					
	h. Forming an					
	eye					
1			1		1	

	GENERAL OBJECTIVE 3.0: Understand the process of gas and metal arc welding.										
Week	Specific	Teachers	Learning	Specific Learning	Teachers	Learning					
	Learning	Activities	Resources	Outcome	Activities	Resources					
	Outcome										
9-12	 1.1 List gas and arc welding equipment 2.1 explain the basic principles and applications of gas and metal arc welding. 1.2 State the safety precautions to be observed and apply them in given welding situations. 1.3 State the uses of different welding tools and equipment 	Describe gas and arc welding equipment Explain the basic principles and applications of gas and metal arc welding. 1.4 Explain the safety precautions to be observed and apply them in given welding situations. Explain the uses of different welding tools and equipment	Oxygen and Acetylene cylinder with regulators. Arc welding set, Goggles, Shield, Electrodes Diagrams and charts of various welding joints and techniques. Whiteboard Marker Projector Computer	Set up and operate gas or metal arc welding equipment in given situations. Prepare joints for welding in given situations Weld given components by arc or gas welding methods, and state safety precautions to be observed	Guide students to: Use of both gas and metal arc welding equipment; and all the students to practice. Prepare joints for welding purposes Weld various components using both gas and arc welding processes and state safety precautions to students to practice till competent	Oxygen and acetylene cylinders with regulations, arc welding equipment, goggles, shield, electrodes, diagrams and charts of various welding joints					

PROGRA	MME: NATIONAL TECHNICAL CERTI	FICATE IN FUNITURE MAK	ING AND UPHOLSTERY.	
MODULE	E: FUNITURE DESIGN AND CONSTRUC	CTION I MO	DULE CODE: CFC 11	TOTAL CONTACT
				HOURS: 240HRS
YEAR: 1	TERM: 3	PRE: REQUISITE:	Theoretical: 36 Hours	
			Practical: 48 Hours	
Goal: This	s module is designed to provide the trainee wi	th the basic knowledge and skill t	o enable him understand simple furnitu	are and Construction
	× .		•	
GENERA	L OBJECTIVES:			
	tion of this module, the trainee should be able	e to:		
1.	Understand design elements.			
2.				
3.	Know Anthropometrics Principles			
4.	Know the principles of timber preparation.			
5.	Understand the interpretation of drawings an	nd sketches		
6.	Know the nature of timber growth and struc			
7.	Know the principles of timber finishing			
8.	Understand timber conversion and seasoning	g.		
9.	Understand timber defects.	-		
10	. Know the technical terms in furniture work.			
11	. Know the adhesives used in Furniture work			

PROG	PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FUNITURE MAKING AND UPHOLSTERY.										
Module	: Furniture I	Design and Con	struction	Ι				MOUDLE CODE: CF	C 11	CONTA	CT HOURS
		-								180	
Module	Specification	n: Theoretical a	and Practi	ical Content							
YEAR:	YEAR: 1 TERM: 3 PRE: The				Theo	retic	al: 36 Hours				
				REQUISI	ГЕ:	Pra	actic	ctical: 144 Hours			
GOAL:	This module	e is designed to	introduce	the trainee to	understan	ıd desi	ign el	ements			
Theore	tical Content							Practical Content			
Genera	l Objective: 1	.0 Understand	design ele	ements							
Week	Specific Lea	rning	Teachers	S	Learning	g		Specific Learning	Tea	chers	Learning
	Outcome		Activitie	S	Resource	es		Outcome	Acti	ivities	Resources

1	1.1 Define design	Explain design	Chalk board.	Carry out a simple design of	Guide the students	Drawing Tables
1	elements	elements.	Chark Obard.	own choice of furniture	to:	and equipment.
	1.2 State the basic design	elements.	Drawing	item.		and equipment.
	elements.	with regards to	instruments.	item.	produce a sketch of	T-Squares
	1.3 Explain how these	types of lines,	mstruments.	Carry out some design work	own choice of	Materials, etc.
	elements affect the quality	shapes and forms	Lesson notes.	applying specific design	furniture item with	Waterfals, etc.
	of a design.	applied in drawing	Lesson notes.	principles to the various	functional	
	1.4 State how these	and how they affect	Whiteboard	design elements.	dimensions	
	elements affect the	dimensions.	Marker		Draw the isometric	
	quality of a design in	******	Projector	Use the anthropometrics	view of a chosen	
	two and three		Computer	principles to determine	piece of furniture.	
	dimensions.			various sizes of different	I	
				types of furniture e.g. chairs,		
				stools, tables, etc.		
Genera	<u>ll Objective 2:0 Know Desig</u>					
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	2.1 Define the various	Explain the various	Chalk board.	Carry out design of	Guide students to	
	design principles i.e.	design Principles	Drawing	furniture items taking	carry out design of	
	balance, movement,	i.e. balance,	instruments.	design principles i.e.	furniture items	
2	repetition, emphasis,	movement,	Lesson notes.	balance, movement,	taking design	
	contrast and unity.	repetition,		repetition, emphasis,	principles i.e.	
	2.2 Explain their effects in	emphasis, contrast		contrast and unity into	balance,	
	application to the design	and unity.		account	movement,	
	elements.	$\Gamma_1 \cdot 1 \cdot \dots \cdot 4 \cdot \dots \cdot 1 \cdot \dots \cdot 1$			nonatition	
		Elaborate on how			repetition,	
	2.3 Describe how the	these design			emphasis, contrast	
	2.3 Describe how the design principles	these design principles apply to			emphasis, contrast and unity into	
	2.3 Describe how the design principles apply to the various	these design principles apply to the various design			emphasis, contrast	
	2.3 Describe how the design principles apply to the various design elements in	these design principles apply to			emphasis, contrast and unity into	
	2.3 Describe how the design principles apply to the various	these design principles apply to the various design			emphasis, contrast and unity into	
	2.3 Describe how the design principles apply to the various design elements in	these design principles apply to the various design			emphasis, contrast and unity into	
	2.3 Describe how the design principles apply to the various design elements in	these design principles apply to the various design			emphasis, contrast and unity into	
	2.3 Describe how the design principles apply to the various design elements in	these design principles apply to the various design			emphasis, contrast and unity into	

Genera	l Objective 3.0: Know Anth	ropometrics Principle	s			
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
3	 3.1 Explain the principles of human proportions and dimensions, e.g. relationship of distance between one part of the body and another. 3.2 Use anthropometrics principles to determine various sizes of different types of furniture, e.g. chairs, stools, tables, 	Draw the three- dimensional views of a chosen object showing the front, side, and plan views. Draw the pictorial view of a chosen furniture item.	Chalk board working using drawing instruments.	Carry out material preparation using anthropometrics principles to determine various sizes of different types of furniture, e.g. chairs, stools, tables, etc.	Guide students to carry out material preparation using anthropometrics principles to determine various sizes of different types of furniture, e.g. chairs, stools, tables, etc.	Tape, try square, saw marking gauge, mortise gauge plane, etc.
Genera	etc. l Objective 4.0: Know the P	rinciples of Timber P	reparation	1		
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
4	4.1 Explain the principles of cutting wood to size using handsaws and machine.	List the tools used for timber preparation and explain their functions.	Chalk board Woodwork tools Materials (wood) Whiteboard	4.1 Explain the principles of cutting wood to size using handsaws and machine.	List the tools needed for timber preparation and explain their functions.	Chalk board Woodwork tools Materials (wood) Whiteboard
			Marker Projector Computer		Guide the students to undertake material preparation	Marker Projector Computer

Genera	l Objective 5.0: Understand	l the interpretation of	drawings and sketc	hes.		
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	5.1 Explain simple	Explain the concept	Drawing	Carry out simple working	Guide students to	Drawing Tables, T-
	working drawing of wood	of working	Equipment	drawing of wood projects.	make carry out	squares
5	projects.	drawings of wood		Interpret conventional	simple working	
	5.2 Identify conventional	projects	Marking out	representation for timber	drawing of wood	
	representation for timber	Explain	tools.	fastenings on a drawer.	projects. Guide	
	fastenings on a drawer.	conventional		Make orthographic	learners to interpret	
	5.3 Define the principle of	representation of	Text books	drawings of simple objects	conventional	
	orthographic projection	timber fastenings		showing	representations	
		Explain the	Chalk board	i. Front view	Guide students to	
		principle of		ii. End view	do orthographic	
		orthographic	Lesson notes.	iii. Plan	drawing of simple	
		projection			objects.	
			Whiteboard			
		students to make	Marker			
		orthographic	Projector			
		drawing of simple	Computer			
		objects.				
		Give drawing				
		assignment				
Genera	l Objective 6.0: Know the na	ature of Timber Grow	with and Structure			
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	6.1 Describe the growth of	Explain timber	Textbooks	Physically distinguish	Guide students to	
	a tree from which timber is	growth and	Chalk board.	softwood from hardwood	differentiate	
6	obtained, how it is fell;	Structure	Samples of woods	trees based on	softwood from	
	and cut into logs for		Lesson notes.	characteristics of each.	hardwood	
	sawmills.	Explain the nature	Whiteboard		Guide them to	
	6.2 Classify timber into	of trees from which	Marker	Classify timber into hard	physically classify	
	two groups: -	timber is obtained.	Projector	and soft wood. Show	timber into two	
	hardwoods and		Computer	samples of these.	groups: -	
	softwood and explain					

	the differencebetween the twoclassifications.6.3 State the maincharacteristics ofhardwoods andsoftwoods.	Explain the classification of timber into hard and soft wood. Show samples of these.			hardwoods and softwood	
	l Objective 7.0: Know the p					
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	7.1 Define finishing.	Explain the concept	Chalk board.	Prepare surfaces of wooden	Guide students to	Spray equipment
	7.2 State the purpose of	of finishing	Samples of wood	items for application of	prepare surfaces of	Spray guns
7	finishing e.g. decoration,	Elaborate on the	finishing	finishing	wooden items with	
	preservation.	purpose of surface	materials	Apply matching stain using	various grade of	
	7.3 State the types of	preparation and		appropriate safety	sandpaper for	
	material used for finishing	finishing e.g. for	Lesson note	equipment.	application of	
	wood	aesthetics,		Use various grades of	finishing material	
	7.4 Explain the working	preservation,	Whiteboard	abrasive paper to prepare	Guide the also to	
	principles of air	hygiene.	Marker	specified surfaces for	apply matching	
	compressors and air-line	Discuss the types of	Projector	finishing.	stain using	
	dryers.	finishing material	Computer		appropriate safety	
	7.5 State the importance of			Apply base coating, e.g.	equipment.	
	fan extractors.	stain, transparent		wood filler, undercoat and		
	7.4 Identify surface	and opaque finishes		sanding sealer.	Apply lacquer or	
	defects.	paint, polish, etc.		Remove surface defect	paint by spraying	
	7.6 Outline the process of	Explain the		preparatory to application of	or by hand brush.	
	staining and filling	principle of air		finish		
	7.7 Explain how to apply	compressors and		Carry out filling and	Maintain and clean	
	stains, e.g. matching	air-line dryers.		staining operation	spray equipment	
	stain using	Discuss the		Apply lacquer or paint by		
	appropriate safety	importance of fan		spraying or by hand brush.		
	equipment.	extractors in surface		Maintain and 1		
		preparation for		Maintain and clean spray		
		finishing		equipment		

Genera	General Objective 8.0 Understand timber conversion and seasoning.							
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning		
	Outcome	Activities	Resources	Outcome	Activities	Resources		
	8.1 Define Timber	Explain conversion	Chalk board	Carry out proper stacking of	Guide students to:			
8	conversion	of timber.		boards as done during	Carry out proper			
	8.2 Describe the two types		Samples of timber	natural seasoning of the	stacking of boards			
	of conversion: a) through	Explain the various	from different	timber.	as done during			
	and through method, (b)	methods of	conversion	Determine and calculate	seasoning of			
	back sawing or quarter	conversion. Discuss	methods	moisture content	timber.			
	sawing method.	the advantages and			Guide students to			
	8.3 State the	disadvantages of	Lesson note		determine and			
	characteristics of each	conversion	Pictures of defects		calculate moisture			
	method of conversion		infested woods.		content			
	8.4 List the advantages	Explain seasoning	Whiteboard					
	and disadvantages of each	and state the	Marker					
	method.	importance of	Projector					
	8.5 Define seasoning	seasoning wood.	Computer					
	8.6 Describe two methods	Describe the two						
	of seasoning	main methods of						
	8.7 Calculate the	seasoning.						
	percentage moisture	Explain the						
	content of timber.	importance of						
	8.8 State the advantages	proper stacking						
	and disadvantages of each	during seasoning.						
	seasoning method.	Explain the						
	8.9 Describe the effect of	importance of						
	proper stacking of	proper stacking						
	boards during							
	seasoning	Explain how to						
		determine moisture						
		content						

	l Objective 9.0 Understand		I			[
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	9.1 Define timber defects	Explain defects in	Whiteboard	Examine and sketch timber	Guide students to	
	9.2 Classify timber defects	timber.	Marker	defects.	physically identify	
9	into two main groups	Explain the various	Projector	Physically identify and	and remedy	
	namely natural and	types of defects in	Computer	classify timber defects.	defective timber	
	artificial defects.	timber - natural and		Take steps to remedy	affected by:	
	9.3 Explain the causes of	artificial.	Chalk board.	defective timber affected by:	Bowing	
	the following timber	Explain natural and	Samples of	i. Bowing	Cupping	
	defects; splits, warp, twist,	artificial defects in	defects infested	ii. Cupping	Gide students to	
	case hardening, collapse,	timber and their	woods.	Sketch different types of	sketch different	
	etc.,	effects.	Lesson note	timber defects	types of defects	
	9.4 Explain the possible	Explain the causes	Pictures of defects			
	causes of the	of timber defects	infested woods.			
	following timber defects;	Discuss how				
	dry rot, wet rot,,	seasoning defects				
	woodborers and how they	can be minimized.				
	can be prevented.	Explain how the				
	9.5 Explain the methods of	effects of bowing				
	preventing natural and	and cupping can be				
	artificial defects in timber.	corrected.				
	9.6 Explain how the effect					
	of bowing and cupping can					
	be corrected.					
Genera	l Objective 10.0 Know the to	echnical terms in furn	iture work.	1	1	
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
10	10.1 State some Technical	Explain the	Whiteboard	Physically identify the	Guide students to	
	Terms used in furniture	technical terms used	Marker	following Nigerian timbers -	physically identify	
	making e.g. Pot life,	in furniture making.	Projector	mahogany obeche, (cedar),	the following	
	blooming, bleaching,	Discuss types of	Computer	afara, abura, omo, etc	Nigerian timbers -	
	staining, padding, tacking	wood found in	1		mahogany obeche,	
	etc.	Nigeria. Explain the	Chalk board.			

Genera	 10.2 Define each of the technical terms stated in item 10.1 above. 10.3 State the names of some common timber found in Nigeria such as mahogany obeche, (cedar), afara, abura, Omo, etc. State the main use of each of the timbers 1 Objective 11.0: Know the a 	characteristics and use of each of the type.	Lesson notes.		(cedar), afara, abura, Omo, etc	
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
11-12	11.1 Define adhesives. 11.2 Name types of adhesives Classify adhesives into interior and exterior types: Interior: - animal, Vegetable and thermo-plastic glues; Exterior:- Phenol formaldehyde (cascamite glue) 11.3 State the characteristics of each type of adhesive listed above. State the advantages and disadvantages of each type of adhesive	Describe different types of adhesives used in woodworking and their application. • Show samples of different adhesives to students. Explain the advantages and disadvantages of different types	Whiteboard Marker Projector Computer Chalk board Lesson note Samples of adhesive materials.	Prepare and apply adhesives. Cure glue lines by normal temperature and artificial heating methods	Guide students to prepare and apply adhesives. Cure glue lines by normal temperature and artificial heating methods	
13	Examination: Practical: - 7	70%: Theory - 30%	•	•		

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FUNITURE MAKING AND UPHOLSTERY.								
MODULE: FURNITURE DESIGN CONSTRUCTION II				MODULE CODE: CFM 12		CONTACT		
					HOURS: 2	240HRS		
YEAR: 2	YEAR: 2 TERM: 2 PRE: REQUISITE:			Theoretical: 36 Hours				
				Practical: 48 Hours				
Goal: The module is desi	gned to provide the tr	ainee with the knowledge and skill t	o enabl	e him design and construct stools, ch	airs and table	es		
GENERAL OBJECTIV	ES:							
On completion of this mod	lule, the trainee shoul	ld be able to:						
1. Know woodwo	1. Know woodwork joints construction.							
	2. Understand the process of carcase construction.							
3. Know Tables and Chairs production.								
4. Understand the Finishing of furniture items.								
5. Understand Fittings and Fastening materials.								

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FUNITURE MAKING AND UPHOLSTERY.									
Modul	e: Furniture Design and Co	nstruction II		MOUDLE CODE: CFC	MOUDLE CODE: CFC 12 CONTACT				
	_				240 Hours				
Modul	e Specification: Theoretical	and Practical Conten	t						
YEAR: 2 TERM: 2 PRE: Theoret			oretical: 48 Hours						
		REQUISITI	E: P	ractical: 192Hours	tical: 192Hours				
GOAL	: This module is designed t	introduce the trainee t	0						
Theore	etical Content			Practical Content					
Genera	al Objective 1.0 Know wood	work joints' construc	tion	·					
	-	·							
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning			
	Outcome	Activities	Resources	Outcome	Activities	Resources			
1 - 4 1.1 Define woodwork joint Explain the Whiteboard			Sketch differ types of	Guide students to sketch	Tools				
1.2 List types of woodwork principle of joint		principle of joint	Marker	sketches	woodwork construct the				
joints in v		in woodwork	Projector	Construct the following	following joints:				
1.3 State the use			Computer	joints:	a. Bare-faced				
	of the following		_		mortised and tenon				

Concr	joints a. Bare faced mortise and tenon joints b. Butt joints c. Housing joints d. Tongue and Grove e. dovetailed joint State the requirements of a good joint d Objective 2.0 Understand th	Name, classify and describe types of woodwork joints Discuss the use of different types of joints. Explain the requirements of a good joint	Tools & equipment. Chalk board Models of specific joints.	 a. Bare-faced mortised and tenon joints b. Butt joints c. Housing joints d. Dovetailed joint 	joints b. Butt joints c. Housing joints d. Dovetailed joint	
Week		Teachers	Learning		Teachers Activities	Learning Resources
5-6	Outcome 2.1 Define carcase 2.2 translate abstract thoughts into sketches. 2.3 State the basic difference between solid wood and carcase construction. 2.4 State the various angles of inclination. 2.5 State the relative angles, shapes and proportions of the various parts.	ActivitiesExplaincarcaseconstruction.ExplainExplaintheprocessoftranslating abstractthoughtsintosketches.Explain the basicdifference betweensolid wood andcarcaseconstructionExplain angles ofinclination.Describe therelative angles,shapes andproportions of thevarious parts.	Resources Chalk board Models. Drawings Lesson note Whiteboard Marker Projector Computer	2.1 Define carcase Translate abstract thoughts into sketches. Identify the various angles of inclination. Construct the relative angles, shapes and proportions of the various parts. Transform the sketches into working/production drawings.	Activities Guide the trainees to: Transform the sketches into working drawings. Prepare working drawing and cutting list of a carcase. Construct the relative angles, shapes and proportions of the various parts of a carcase Assemble the carcase	Resources Drawing board T-Squares, pencils Set Square and

Genera	al Objective 3.0: Know Tables	and Chairs product	ion.			
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	3.1 State various types of	List and explain	Chalk board	Make simple designs and	Guide students to produce	Chalk board
	chairs e.g.	various types of	Lesson note	working drawing of chairs.	designs and working	
7-9	dining chair, easy chair, and	chairs	Drawings	Construct a simple chair	drawing of a simple chair	Models.
	rocking chair.	Explain the		Identify the various types	and construct the chair	
	3.2 Describe designs and	designs and		of tables e.g. dining table,	Guide them to identify the	Materials
	working drawing of chairs.	working drawings		reading table, conference	various types of tables e.g.	
	3.3 State various types of	of different types		table etc. Make a simple	dining table, reading table,	
	tables e.g. dining table,	of chairs.		design of a table	conference table etc. Make	
	reading table, conference	List and describe		Produce a working	a simple design of a table	
	table etc.	various types of		drawing of specific type of	Produce a working	
	3.4 Describe working	tables.		table.	drawing of specific type of	
	drawing of specific type of	Explain the		Prepare cutting list.	table.	
	table.	contents of a		Construct the table	Prepare cutting list and	
	3.5 State the contents of a	cutting list			construct the table	
	cutting list.					

Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	4.1 Define finishing	Discuss the use of	Chalk board	Prepare surface for	Guide students to select the	Spray
	4.2 List different types of	wood finishing.	Lesson note	application of finishing	appropriate finishing	equipment
10-11	finishing materials	Explain the		material with brush.	material, prepare the	Materials.
	4.3 Explain the purposes of	purpose for		Apply finishing material	surface of wood and apply	
	finishing wood surface:	application of		with brush.	finishing material with	
	hygiene, preservation, and	wood finish.		Carry out preparation for	brush and spray equipment	
	aesthetics.	Explain the		application of finishing		
	4.4 Name and state the	composition of		material with spray		
	composition of	common material		equipment. Apply finishing		
	common materials used	used for finishing.		material with		
		Describe different		spray equipment		

Compare	for finishing wood surfaces. 4.5 State different methods of applying finishing materials 4.6 State the advantages and disadvantages of each method 4.7 State the process of applying finishing material with spray equipment al Objective 5.0: Understand I	methods of application of finishing material Explain different methods of applying finishing materials Discuss the advantages and disadvantages of each method Demonstrate the process of applying finishing material with brush and spray equipment	a matariala			
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
12	 5.1 Define furniture fittings 5.2 List types of furniture fittings 5.3 Classify furniture fittings hinges, handles, locks, catches, stays, etc. 5.4 Explain how fasteners are used to hold two parts together. 5.5 State the properties of materials used for common fittings - brass, mild steel, aluminum, plastics, etc. 5.6 Define wood fasteners: 	Explain furniture fittings Discuss types of furniture fittings Discuss classification of furniture fittings hinges, handles, locks, catches, stays, etc. Explain how fasteners are used to hold two parts together. Explain the properties of	Chalk board Samples of fittings and fastenings, e.g. locks handles etc. Whiteboard Marker Projector Computer	Select and fix different types of fasteners such as Screws, nails, corrugated fasteners, bolts and nuts; Sketch different types of fitting Select and fix different type of fittings such as hinges, handles, locks, catches, stays, etc. on finished furniture item. Sketch different types of fittings	Guide students to select and fix different types of fasteners such as Screws, nails, corrugated fasteners, bolts and nuts; and fittings such as hinges, handles, locks, catches, stays, etc. on finished furniture item.	Screwdrivers, hammer Gimlet, hand drill.

fasteners common furniture	
Classify wood fasteners fittings	
hinges, handles, locks,	
catches, stays, etc. Explain wood use	
5.8 Explain how fasteners of fasteners:	
are used to hold two parts List types of wood	
together. fasteners	
5.9 State the properties of Classify wood	
materials used for common fasteners.	
fasteners - brass, mild steel, State the	
aluminum, plastics, etc. properties of	
materials used for	
common fasteners.	
Explain the	
difference between	
fasteners and	
fittings.	
13 Examination: Practical: - 70%: Theory - 30%	

PROGRAMME: NA	PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FUNITURE MAKING AND UPHOLSTERY.									
MODULE: FURNI	FURE DESIGN CONST	RUCTION III	MO	MODULE CODE: CFC 13		CONTACT				
					HOURS: 1	l44HRS				
YEAR: 3	TERM: 2	PRE: REQUISITE:		Theoretical: 24 Hours						
				Practical: 120 Hours						
GOAL: The module i	is designed to provide the	trainee with the knowledge and skill	to enab	le him construct cabinet and bed						
GENERAL OBJEC	TIVES:									
On completion of this	s module, the trainee shou	ld be able to:								
1. Understand	d the characteristics of nat	ural timber and manufactured boards	•							
2. Know the	design and construction c	arcase cabinets.								
3. Understand	d lipping and veneering of	furniture items.								

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FUNITURE MAKING AND UPHOLSTERY.									
Module	e: Furniture Design and Cor	nstruction III			MOUDLE CODE: CF	C 13	CONTACT 144	Γ HOURS:	
Module Specification: Theoretical and Practical Content									
YEAR: 3 TERM: 2 PRE: REQUIS		QUISITE:	ISITE: Theoretical: 24 Hours						
			-	Practical: 1	20Hours				
GOAL	This module is designed to	introduce the trainee to)						
	tical Content				Practical Content				
Genera	l Objective 1.0. Understand	the characteristics of	natural timb	er and manufa	ctured boards.				
	-								
Week	Specific Learning	Teachers	Learning		Specific Learning	Teachers	L	earning	
	Outcome	Activities	Resources		Outcome	Activities	R	lesources	
1-2	1.1 Define Natural timber	Describe natural	Samples of timber,		Identify different types	ntify different types Guide students t			
	1.2 State the	timber	-		of natural timber	identify di	ifferent		
	characteristics of natural	Explain the	plywood,			types of na	atural		
	timber	characteristics of			Carry out physical	Carry out physical timber			
	1.3 State the advantages	natural timber	particle boa	rd	identification of				
	and disadvantages of	Discuss the	_		different	Carry out			
	natural timber	advantages and	block-board	l,	manufactured	identificat	ion of		
	1.4 Define manufactured	disadvantages of			board	different			
	Board	natural timber	Whiteboard		Use natural wood for manufact		ired		
	1.5 List different types of	Describe	Marker		a given project board				
	manufactured boards	manufactured	Projector						

Genera	1.6 State the characteristics of manufactured board 1.7 State the advantages and disadvantages of natural timber 1.8 State the main uses of manufactured board	board Discuss different types of manufactured boards Discuss the characteristics of manufactured board State the advantages and disadvantages of natural timber State the main use of manufactured board. esign and construction	Computer carcase cabinets.	Use different manufactured boards for different projects particleboard, block board, etc.	Use natural wood for a given project Use different manufactured boards for different projects particleboard, block board, etc.	
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
3-7	 2.1 List different types of cabinets e.g. wardrobe, side furniture, chest of drawers, sideboard, etc. 2.2 State the design of a chosen type of carcase 2.3 Discuss the Preparation of cutting list 2.4 Explain the select and preparation of the joints to be used- e.g. dowelling joint, etc. 2.5 State the process of assembling carcase with adhesive and glue blocks. 2.6 State the steps of Constructing drawers with lap dovetail joint 2.7 Identify the various methods of securing drawers into the carcase e.g. runner or slide and fix them. 	 2.1 Explain the different types of cabinets e.g. wardrobe, side furniture, chest of drawers, sideboard, etc. 2.2 Explain the Design of a chosen type of carcase 2.3 Discuss the Preparation of cutting list 2.4 Explain the select and preparation of the joints to be used-e.g. dowelling joint, etc. 2.5 State the process of assembling carcase with 	Woodwork tools. Finishing materials fittings. Whiteboard Marker Projector Computer	Design a chosen type of carcase Prepare cutting list Select and prepare the joints. Assemble carcase with adhesive Construct drawers with lap dovetail, grooving, housing, pinning, dowelling joint. Securing drawers into the carcase e.g. runner or slide and fix them. Construct and fix shelves (permanent, loose, adjustable). 2.9 Construct and fix various types of doors e.g.: - plane panel, raised panel, glazed	Guide students to design carcase and prepare cutting list for its construction. Guide them to construct joints. and assemble carcase, fix into the carcase Guide them to also construct and fix various types of doors and plinth	Screw driver, saw, chisel, hammer, cramps, etc.

	 2.8 State the process of constructing and fixing shelves (permanent, loose, adjustable). 2.9 Outline how to fix plane panel, raised panel, glazed door, sliding doors, etc. 2.10 Outline the design and construction of box plinth, stool plinth 	adhesive and glue blocks. 2.6 State the steps of Constructing drawers with lap dovetail joint 2.7 Identify the various methods of securing drawers into the carcase e.g. runner or slide and fix them. 2.8 State the process of constructing and fixing shelves (permanent, loose, adjustable). 2.9 Outline how to fix plane panel, raised panel, glazed door, sliding doors, etc. 2.10 Outline the design and construction of box plinth, stool plinth		door, sliding doors, etc. Design and construct box plinth, stool plinth, cabriole leg and metal legs.		
Genera	l Objective 3.0: Understand	lipping and veneering	of furniture items.			
Genera Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Specific Learning Outcome	Teachers Activities	Learning Resources	Outcome	Activities	Learning Resources
	Specific Learning Outcome 3.1 Outline the purpose of	Teachers Activities Give the students	Learning Resources Veneers	OutcomeCarry out lipping ang	Activities Guide students to	
Week	Specific Learning Outcome 3.1 Outline the purpose of lipping	Teachers Activities Give the students some specific	Learning Resources Veneers Tools	Outcome Carry out lipping ang veneering process	Activities Guide students to accomplish a	
	Specific Learning Outcome 3.1 Outline the purpose of lipping 3.2 Demonstrate the	Teachers Activities Give the students some specific projects involving	Learning Resources Veneers Tools Samples of finished	OutcomeCarry out lipping ang veneering process Scrape and sandpaper	Activities Guide students to accomplish a project involving	
Week	Specific Learning Outcome 3.1 Outline the purpose of lipping 3.2 Demonstrate the process of veneering	Teachers Activities Give the students some specific projects involving lipping and	Learning Resources Veneers Tools Samples of finished project with lipping and	OutcomeCarry out lipping ang veneering processScrape and sandpaper material paper ready	Activities Guide students to accomplish a project involving lipping and	
Week	Specific Learning Outcome 3.1 Outline the purpose of lipping 3.2 Demonstrate the	Teachers Activities Give the students some specific projects involving	Learning Resources Veneers Tools Samples of finished	OutcomeCarry out lipping ang veneering process Scrape and sandpaper	Activities Guide students to accomplish a project involving	

	3.4 Scrap and glaze paper	them in performing	Marker		performing the		
	ready for finishing.	the task	Projector		task		
	3.5 identify the appropriate		Computer				
	bonding material fir						
	veneering						
Week	Examination: Practical: - 70%: Theory - 30%						
13		-					

PROGRAMME: NATIO	PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FUNITURE MAKING AND UPHOLSTERY.									
Module: UPHOLSTERY	Module: UPHOLSTERY DESIGN AND CONSTRUCTION			MODULE CODE: CFC14		CONTACT				
					HOURS: 2	240HRS				
YEAR: 3	TERM: 1	PRE: REQUISITE:	UISITE: Theoretical: 36 H							
				Practical: 204 Hours						
GOAL: The module is aimed to provide the trainee with the skill to enable him design and construct a complete upholstered furniture										
GENERAL OBJECTIV	ES:									
On completion of this mo	dule, the trainee shoul	d be able to:								
1. Know the desig	n and Construction of	f Upholstery Car-case.								
2. Know the princ	iples of upholstery co	onstruction.								
3. Understand uph	nolstery fabrics and le	ather materials.								
4. Know the proce	ess of fixing upholster	y material.								
5. Understand the	design of upholstered	l furniture.								

PROG	PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FUNITURE MAKING AND UPHOLSTERY.										
Module	: UPHOLSTERY DI	SIGN AND CONSTRU	CTION		MOUDLE CODE:	CFM 14	CONTACT H	IOURS: 7hrs/wk			
							PER WEEK:	T2, P5			
Module	Module Specification: Theoretical and Practical Content										
YEAR:	YEAR: 3 TERM: 1 PRE: REQUISITE: Theoret		ical: 36 Hours								
				Practi	ical: 48 Hours						
GOAL	GOAL: This module is designed to introduce the trainee to										
Theore	Theoretical Content Practical Content										
Genera	l Objective: 1.0 Kno	w the design and Consti	ruction of Up	holstery (Car-case.						
		-	_	-							
Week	Specific Learning	Teachers	Learning		Specific Learning	Teachers		Learning			
	Outcome	Activities	Resources		Outcome	Activities		Resources			
1 – 3	1.1 Define design	Explain the concept	Drawings		Transform an idea	Guide students to	:				
	1.2 State the steps	of design	Models		into product	Transform an idea	a into product.				
	of transforming	Explain the steps of	Lesson note	•	Make a neat	Make a neat skete	ch and				
	ideas into a product.	transforming an idea			sketch and	pictorial drawing	of a given				
	1.3 Define pictorial	into product	Whiteboard	l	pictorial drawing	carcase.					
	drawings		Marker		of a given carcase	e					

Genera	 1.4 Define working drawings. 1.5 List the parts of carcase such 1.6 Describe the method of assembling carcase 	Explain the concept of pictorial drawings e.g. oblique, isometric, perspective, projections. Describe parts of a carcase. Explain method of assembling a carcase	Projector Computer	Identify parts of a carcase. Construct different parts of a carcase and assemble them	Construct different parts of a carcase and assemble them	
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	2.1 Define	2.1 Explain the basic	Chalkboard	Identify different	Guide students to :	Drawings
	upholstery	principles of	Glue/tack nails	types of	Identify different types of	Cutting list
	construction.	upholstery	Sewing machine	upholstery work.	upholstery work.	Jigs
3-5	2.2 State different	construction.	Measuring tape	Construct	Construct different types of	
	types of upholstery.	Describe different	Lesson note	different types of	upholstery. Use different types	
	2.3 Explain the	types of upholstery		upholstery. Use	of adhesive	
	purpose of frames	2.2 Explain the	Whiteboard	different types of		
	and how to achieve	purpose of frames and	Marker	adhesive.		
	strength and	how to achieve	Projector		Identify and compare the	
	rigidity.	strength and rigidity.	Computer	Identify and	properties of upholstery and	
	2.4 State the	2.3 Explain the		compare the	bedding fittings.	
	requirements in	requirements of		properties of	Identify and use hand tools	
	chair frames to	frames for supporting		upholstery and	used in upholstery work	
	support the type of	upholstery.		bedding fittings,	Demonstrate the use of the	
	upholstery such as	2.4 Describe the		e.g. latex foam,	following power tools: Carry	
	loose seat, show-	characteristics of the		plastic foam,	out sewing operation in u	
	wood, stuff over.	various kinds of		natural fibers,		
	2.5 Recognize the	upholstery		synthetic fibers.		
	characteristics of	2.5 Discuss types of		Identify and use		
	the various kinds of	adhesive and		hand tools used		
	upholstery			in upholstery		

2.6 Name the main	fasteners used in	work e.g.	
types of adhesive	upholstery	hammer,	
and fasteners used	2.6 Describe the	scissors, web	
in upholstery e.g.	hand tools used in	stretcher, needles	
rubber-based	upholstery work	and awls,	
solution,	2.7 Explain the	ripping, chisels,	
polyurethane, tack	operational principles	mallet staple,	
nails, stud, staple	and use of the	knife, measuring	
pin, etc.	following power	tape rule.,	
2.7 State the types	tools: stapling gun	Demonstrate the	
of hand tools used	(pneumatic and	use of the	
in upholstery, e.g.	electric, powered	following power	
hammer, scissors,	cutters, electric iron,	tools: Stapling	
web stretcher,	foam cutter, drills	gun (pneumatic	
needles and awls,	(pneumatic and	and electric),	
ripping chisels,	electric)	powered cutters,	
mallet stapler,	2.8 Describe the main	electric iron,	
knife, measuring	parts of the sewing	foam cutter drills	
tape, rule, etc.	machine,	(pneumatic and	
2.8 State the use of	2.9 Explain the	electric).	
the following power	function of a sewing	Carry out sewing	
hand tools, stapling	machine in upholstery	operation in	
gun (pneumatic and	work	upholstery work	
electric, powered			
cutters, electric iron,			
foam cutter, drills			
(pneumatic and			
electric), bottom			
mould.			
2.9 List the main			
parts of the sewing			
machine,			
2.10 State the use			
of a sewing machine			
hand tools, stapling gun (pneumatic and electric, powered cutters, electric iron, foam cutter, drills (pneumatic and electric), bottom mould. 2.9 List the main parts of the sewing machine, 2.10 State the use	machine in upholstery	operation in	

Week	Specific Learning Outcome	Teachers Activities	Learning Resources	Specific Learning Outcome	Learning Resources
	3.1 Explain the need		Fabrics &	Cut fabric and	• Template
	for accurate	of accurate	leatherettes	leatherette to size	Sewing machine
7-9	measurement	measurement and the	materials.	and shape as per	• Fabrics. Etc.
	and correct	provision of correct	Tools and	template.	
	sewing	sewing allowances.	equipment.	1	
	tolerance.	e		Identify the parts	
	3.2 Explain the		Whiteboard	of a sewing	
	behaviour of		Marker	machines.	
	covering		Projector	Identify and	
	materials under		Computer	attach the	
	the cutting			following: pipe	
	process and			foot, gathering	
	recommend the			foot, zip fastener	
	necessary			foot.	
	tolerance for				
	shrinkage or			Select the correct	
	overstretching.			type of needle and	
				thread for given	
				kinds of materials.	
				Adjust the sewing	
				machine to suit	
				the fabric or	
				leatherette.	
				Sew, pipe and	
				hem the fabric or	
				leatherette to size	
				and shape.	

Week	Specific Learning Outcome	Teachers Activities	Learning Resources	Specific Learning Outcome	Teachers Activities	Learning Resources
	4.1 Identify the	 Explain suitable 	Rubber web, spring,	Measure and cut	• Guide the students to:	
	required type	material for	tack nail.	material to	measure and cut material to	
10	material	different		required size and	required size and shape	
	4.2 State the process	purposes		shape	Stretch fabric or leatherette at	
	of fixing	Demonstrate the		Stretch fabric or	the appropriate places and tack	
	upholstery	process and		leatherette to and	them.	
	fabric or	describe methods		tack them.		
	leatherette.	of fixing			Check for correct fitting.	
		upholstery		Check for correct		
		fabrics or		fitting.	Assemble to all the parts e.g.	
		leatherette.		_	arm rest, seat and back.	
				Assemble to all		
				the parts e.g. arm	• Cover bottom and fix	
				rest, seat and	castors.	
				back.		
				Cover bottom and		
				fix castors.		
Genera	al Objective 5.0: Under	rstand the design of uph	iolstered furniture			
Week	Specific Learning	Teachers	Learning	Specific Learning	Teachers	Learning
	Outcome	Activities	Resources	Outcome	Activities	Resources
	5.1 State the	Explain the steps in	Materials	Design and	Guide students to:	Upholstery
	sequence of	carrying out	Tools	upholstered		tools &
11-12	upholstery	upholstery	Lesson notes	furniture e.g. Arm	design and construct upholstery	equipment
	construction such	construction such as:	Whiteboard	chair.	furniture to factory standard.	
	as: Framing,	framing, webbing,	Marker		Guide them to also apply	
	webbing, springing,	springing, stuffing,	Projector	Apply webbing,	webbing, fix spring and apply	
	stuffing, fabric	and fabric covering	Computer	e.g. spacing,	lacing, stitching, stuffing and	
	covering and fox	and fox edging.	_	weaving, etc.	burlap.	
	covering and lox	and for eaging.		weaving, etc.	ourrup.	

	5.2 State the	Outline the sequence	Fix spring and	
	sequence of	of assembling the	apply lacing,	
	assembling the	carcase.	stitching, stuffing	
	carcase.	Describe the methods	and burlap.	
	5.3 State the	of applying webbing,		
	methods of fixing		Cut and sew to	
	webbing, material.		pattern.	
			Cover with fabric	
			or leatherette, etc.,	
			observing Y-cut,	
			notching, etc.	
13	Examination: Practi	ical: - 70%: Theory - 30%		

S/NO	MACHINES	QUANTITY REQUIRED
1	Pull-Over Cross Cutting Machine	4
2	Circular Bench Saw	4
3	Dimension Saw	4
4	Surface Planer	4
5	Combined Planer Thicknesser	2
6	Narrow Band Saw	4
7	CNC Router	2
8	Mortising Machine	4
9	Tenoning Machine	4
10	Pedestal Drill	2
11	Disc Sander	2
12	Wood Turning Lathe Machine	2
S/NO	PORTABLE POWER TOOLS	QUANTITY REQUIRED
1	Portable Power saw	4
2	Portable Power planer	4
3	Portable Power drill	4
4	Portable Power orbital sander	4
5	Portable Power drum sander	4
6	Portable Power jig saw	4
7	Portable Power router	4
1	Complete Electrical Spray equipment	4 sets
2	Completer Petrol Operated Spray Equipment	2 sets
S/NO	TOOLS	QUANTITY REQUIRED
1	Paint brushes (sets)	10
1		10

LIST OF EQUIPMENT FOR FURNITURE MAKING AND UPHOLSTERY

3	Marking gauge	20
4	Mortise gauge	20
5	Marking knives	30
	<u>Squares</u>	
6	Try square	25
7	Mitre square	25
8	Sliding bevel	25
9	Tape (metric) rule	30
10	Jack plane	25
11	Smoothing plane	25
12	Block plane	10
13	Rebate plane	10
14	Grooving/plough plane	10
15	Bull-nose plane	10
16	Jointing plane	5
17	Router Plane	5
18	Rip Saw	15
19	Crosscut/Hand saw	25
20	Tenon saw	20
21	Pane saw	15
22	Coping saw	20
23	Nest of saw/compass saw	15
24	Key-hole saw	10
25	Fret Saw	6
26	Dovetail/back saw	15
27	Firmer Chisel	20 sets
28	Bevel-edge Firmer Chisel	20 "
29	Mortise (set) chisel	20 "
30	Turning chisel	10 "
31	Centre Bits	5 sets

32	Auger Bits	5 sets
33	Twist Bits	10 "
34	Countersink	5 "
35	Rose	5 "
36	Gimlet	5 "
37	Ratchet braces	20 "
38	Breast drills	20 "
39	Drills Bits	20 "
40	Screw Driver (set of 6)	10 "
41	Mallet	20 "
42	Claw-hammer	10
43	Ball pein hammer	10
44	Warrington hammer	10
45	Bradawl	20
46	Pincers	20
47	'F' Cramp	10
48	Sash cramp	10
49	Gee ('G') cramp	20
50	Hand cramp	10
51	Corner cramp	10
52	Bench-hold fast	20
53	Triangular files (set)	15
54	Flat files	20
55	Scraper (flat)	30
56	Dividers	15
57	Round files (set)	10
58	1/2 Round files	10
59	Scraper (cabinet)	10
60	Dowelling Jig	5

S/NO	TOOLS	QUANTITY REQUIRED
61	Rasps	10
62	Sewing machine	2
63	Scissors	10
64	Staplers	10
65	Needles (set) curved and straight	20
66	Tack hammer	10
67	Gimlets	5
68	Pliers	5
69	Magnetic hammer	10
70	Knives	5
71	Ripping chisel	10
72	Mallets	10
73	Screw drivers	2 sets
74	Tape measures	10
75	Webbing strainer	20
76	Spring cutter	5
77	Spanners & Wrenches	2 sets
78	Work benches	5
79	Storage cub boards	2
80	Button making machines	1

S/N	MOUDULE	PRACTICAL CONTENT
	TITTLE/CODE	
1	Fundamentals of	Mount and dismount the machine correctly. E.g. Saw blade.
	Woodworking I (CMW 11)	Sharpen the blade correctly.
		Set up and use the machine to carry out cutting operations such as crosscutting, miter cutting,
		trenching.
		Observe safety measures when using the machine.
		Carry out routine service and maintenance such as cleaning, periodic greasing and oiling on the
		machine
		Mount and dismount saw blades correctly.
		Fix and adjust the riving knife correctly.
		Set up and use the circular saw for the following operations:
		a. Label sawing using canting fence.
		b. Grooving,
c. Rebating,		c. Rebating,
		d. Tenoning, mitering
		Set and sharpen saw blade correctly
		Mount and dismount saw blade correctly
		Set up and use dimension saw to carry out the following operations to specification:
a. Cross cutting to length b. Mitering c. Tongue and groove d. Chamfering		
		e. Levelling
		f. Tenoning
		g. Compound angular cutting
		h. Rebating
		i. Ripping, etc.
		Undertake routine servicing and maintenance of the dimension saw. E.g. cleaning and lubricating
		Perform the following operations with the surface plane
		a. Surfacing and edging
		b. Tapering
		c. Chamfering
		d. Through and stopped rebating

PRATICAL MANUAL FOR NTC FURNITURE MAKING AND UPHOLSTERY

		Mount and dismount cutters correctly
		Grind, hone and set cutters.
		Undertake routine service and maintenance of the surface planer
		Sharpen and set cutters using: -
		a. Patent device
		b. Wooden straight edge
		Mount and dismount the cutters correctly.
		Undertake routine service and maintenance on the machines.
		Set-out rods for common woodwork items such as doors stool, kitchen unit, bookshelves, etc.
		Prepare route sheets for the production and joinery and furniture items.
		Produce setting-out rods for common woodwork/joinery/furniture items such as door, bookshelves,
		etc.
		Mount and dismount the saw blade on the wheels correctly.
		Set up and use the machine for various band sawing operations.
		Produce and use simple jig for various band sawing operations.
		Calculate the length of the band saw blades.
		Set and sharpen saw blade (manually or with sharpening machine).
		Braze or butt-weld band saw blade.
		Undertake routine service and maintenance of the narrow bad sawing machine.
		Perform the following operations with the CNC router.
		a. designs (decorations) on panel doors
		b. design on beds etc.
2	Fundamentals of	Install and remove cutters correctly 1.2 Set up the machine for normal and repetitive mortising
	Woodworking II (CMW	operation.
	12)	Carry out mortising operations to given specifications.
		Apply routine safety and operational precautions related to the use of the machine.
		Grind and sharpen mortise chisel/chain.
		Set vertical and horizontal head adjustments.
		Apply the safety and operational precautions related to the use of the tenoning machine.
		Grind and sharpen mortise chisels chains.
		Set scribing cutters to produce the mould 2.5 Adapt the machine for trenching, square tenoning and
		comb joints, turn tenon.
		Set up tenoning machine and produce mitre tenons.

Design and produce suitable jig that is safe for use on the machine
Balance each pair of cutters on the tenoning machine.
Undertake routine servicing and maintenance on the machine.
Select bits suitable for given jobs
Mount and dismount bits correctly
Mark out work pieces for drilling operations 3.4 Make simple jigs and fixtures for repetitive drilling operations.
Set machine for various drilling operations such as single holes, double holes, stopped or blind holes, through holes etc.
Carry out drilling operations to factory specification.
Sharpen bits to correct profile and keenness.
Replace worn belts.
Undertake routine service and maintenance on the drilling machine.
Select the correct size of drill bit and fix on chuck.
Set up drilling machine and drill holes on timber accurately
Identify all the component parts of the potable power tools.
Carry out the following operations on:
a. Ripping, bevel cutting and mitre cutting on a portable saw
b. Surfacing, chamfering, etc. with a planer
c. Stopped hole, through hole, etc. with a power drill
d. Sanding operation with portable sander
e. Cut curved surfaces with a jig saw
f. Grooves and chamfer a with power router
Identify all the component parts of the overhead travelling belt sanding machine and explain the functions of the weighted lever.
Use the fence or the table and pressure pad.
Mount the belt, stain and track correctly on the overhead sander
Adjust the worktable to convenient working height.
Apply the belt to the face of the job using one of the following:
e. Hand pad
f. Travelling pressure pad
Perform the following operations with the surface planer"
a. Surfacing and edging.
b. Tapering

		c. Chamferingd. Through and stopped rebating		
		Mount and dismount cutters correctly		
		Grind, hone and set cutters.		
		Undertake routine service and maintenance of the surface.		
		Carry out the following operations on a circular sawing machines:		
		- ripping stock to width		
		- cutting stock to length		
		- grooving		
		- trenching		
		- bevel cutting		
		- miter cutting		
		Construct angle and widening joints using hand tools.		
		Make woodwork items based on carcase construction - small bathroom cabinets, trinket box, etc.		
		Test carcase for squareness and out of wind		
		Lip edges of man-made boards		
		Using: veneer solid piece (plain or moulded) etc. Make simple carcase moulding, e.g., simple-edged		
		moulding, chamfer, nosing and rounding.		
		Sketch common carcase construction joints. h. Assemble frame.		
		Test the frame for squareness and out of wind.		
		Make projects using the joints listed in 8.1 picture, frame cabinet door etc.		
		Select tools and demonstrate frame installation required.		
		Produce the joints using hand and machines.		
		Apply hand tools correctly in accordance with instructions given for the construction of frames		
		Perform edge banding.		
3	Wood and Metal Finishing	Prepare a layout sketch of a standard spray boot showing standard structural requirements e.g.		
	(CPD 12)	lighting, types and sizes of work stations, safety installations, storage facilities, etc.		
		Make outline sketches showing the layout features of a typical low bake and make conveyor ovens.		
		Identify necessary considerations for effective spraying and describe methods of their attainment e.g.		
		pure air, adequate temperature and humility, proper lighting.		
		Dry the prepared surfaces by using air duster or chamois leather.		
		Mask up job prior to spray painting using:(i) masking paste(ii) masking tape(iii) masking paper.		
		Spray test area taking care to adjust:(i) material setting(ii) pressure.		

		Prepare newly fabricated and rusted (old) ferrous metal surfaces, aluminium alloy surface, glass fibre		
		reinforced plastics and resinous and oily woods for spray finishing.		
		Carry out masking operation.		
		Organize and execute operations involved in spray finishing such as cellulose synthetic (half-hour		
		enamel), acrylic enamel and other classes of metallic paints:(i) complete spray from bare metal(ii)		
		refinishing over an existing finish(iii) local repair.		
		Identify the essential operations after spraying and explain their importance e.g. removal of masks,		
		burnishing, polishing, removal of over-spray, cleaning and refitting of parts removed from machine,		
		vacuum cleaning of the interior, lining work.		
		Spot defects in finished spray work and explain their possible causes, preventive and repair measures		
		e.g. blistering, blooming, brushing, bridging, cob-webbing dry spray, excessive overspray, lifting,		
		orange peel, pin-holing, runs, sags, curtains, shelving, discoloration, etc.		
		Execute final detailed operations after spraying. 1.13 Inspect finishing and refinishing job and certify		
		that it is good enough to factory standard.		
		Check for defects and take preventive or remedial measures against such defects in furniture		
		spraying work.		
		Identify and replace defective parts of the spray gun.		
		Dismantle the gun.		
		Clean up the spray gun components with appropriate solvent.		
		Grease and oil spray gun components to prevent rusting.		
		Re-assemble spray gun components for storage.		
		Maintain other tools used in spray painting.		
		Tidy up work and work environment/premises		
4	General Metal Work I (CME 11)	Using and handling hand tools, portable power tools and machine		
		Lifting, moving and storing materials or job		
		Demonstrate first aid application in cases of minor cuts, electric shock, burns		
		Describe the essential features and use of the following		
		a Micrometer		
		b Vernier caliper		
		c Venier height gauge		
		d Combination Set		
		Maintain and care for the instruments listed above		

Perform marking out exercise on plane surfaces including profiles			
File a piece of metal to given specifications using any of the following: Cross filing, draw filing,			
filing square and flat surfaces			
Test surface for flatness using surface plate and try square and state precautions to be taken to avoid			
pinning			
Maintain files in good working conditions			
Apply various hammers and mallets e.g. ball pen, rubber mallets, etc. for engineering purposes			
Select and insert hacksaw blade correctly			
Cut metal and other engineering materials to given specification using the adjustable hacksaws,			
junior hacksaws, piercing saw, etc. drills and Drilling.			
Setting up and operate a drilling machine in given situations			
Note Setting up drilling machine should include			
a) change of spindle speed			
b) adjustment of drilling table to required height and angle, holding of work on drilling table to			
required height and angle, using appropriate clamping device.			
c) Install the drill bit in chuck			
Sharpen a twist drill correctly to manufacturers' specification			
Perform with facility the following operations:			
- drilling blind holes			
- drilling round stock			
- counter-drilling and countersinking			
- drilling large diameter holes			
List the operation sequence and cut internal (through and blind) and external threads by hand method			
and state precautions to be taken when taping on the bench			
Rivet metals together in any given situations			
Mark out only given bench work using datum points, datum lines, datum faces, chalk or marking			
solution, center or dot, punch, scribing block or measurement transfer.			
Sharpen cutting tool for plain turning, shouldering, parting off and facing operations			
Set up rough and turned stock in 3-jaw-chuck			
Select appropriate cutting tool and set them up to Centre height for turning or facing operations			
Carryout chuck work involving facing, step turning, undercutting radios using, chamfering, parting			
off and knurling Note, components should be produced to specified tolerance and finish.			
Produce simple components involving taper turning using the compound slide			

5	General Metal Work II	Carry out the following heat treatment processes Hardening, tempering, annealing, normalizing, case			
	(CME 12)	hardening on given plain carbon steel, engineering component or tool.			
		Anneal copper, brass and aluminium for various purposes			
		Select appropriate forging tools and produce to specification given engineering components by forging			
		processes			
		e. Upsetting – drawing down			
		f. Setting down – twisting			
		g. Forge welding (scarf and spice welds)			
		h. Bending, turning closed ring			
		i. Forming an eye			
		Set up and operate gas or metal arc welding equipment in given situations. Note: Equipment			
		operation should include choice of correct nozzles or electrode. Adjustment for correct gas			
		pressure/flame or voltage.			
		Prepare joints for welding in given situations.			
		Weld given components by arc or gas welding methods, and state safety precautions to be observed			
6	Furniture Design and	Carry out a simple design of furniture item of own choice.			
	Construction I (CFC 11)	Carry out some design work applying specific design principles to the various design elements.			
		Use the anthropometrics principles to determine various sizes of different types of furniture e.g.			
		chairs, stools, tables, etc.			
		chairs, stools, tables, etc. Saw timber to given length and width			
		chairs, stools, tables, etc. Saw timber to given length and width Use hand tools to make simple joint			
		chairs, stools, tables, etc. Saw timber to given length and width Use hand tools to make simple joint Plane timber to size by following the proper sequence:			
		chairs, stools, tables, etc. Saw timber to given length and width Use hand tools to make simple joint			
		chairs, stools, tables, etc. Saw timber to given length and width Use hand tools to make simple joint Plane timber to size by following the proper sequence: i. Plan the face side and mark ii. Plan face edge square to the face size and mark. Gauge to correct width and remove waste.			
		chairs, stools, tables, etc. Saw timber to given length and width Use hand tools to make simple joint Plane timber to size by following the proper sequence: i. Plan the face side and mark ii. Plan face edge square to the face size and mark.			
		chairs, stools, tables, etc. Saw timber to given length and width Use hand tools to make simple joint Plane timber to size by following the proper sequence: i. Plan the face side and mark ii. Plan face edge square to the face size and mark. Gauge to correct width and remove waste. Select tools for marking out: a. Try square.			
		chairs, stools, tables, etc. Saw timber to given length and width Use hand tools to make simple joint Plane timber to size by following the proper sequence: i. Plan the face side and mark ii. Plan face edge square to the face size and mark. Gauge to correct width and remove waste. Select tools for marking out: a. Try square. b. Pencil.			
		chairs, stools, tables, etc. Saw timber to given length and width Use hand tools to make simple joint Plane timber to size by following the proper sequence: i. Plan the face side and mark ii. Plan face edge square to the face size and mark. Gauge to correct width and remove waste. Select tools for marking out: a. Try square. b. Pencil. c. Rule			
		chairs, stools, tables, etc. Saw timber to given length and width Use hand tools to make simple joint Plane timber to size by following the proper sequence: i. Plan the face side and mark ii. Plan face edge square to the face size and mark. Gauge to correct width and remove waste. Select tools for marking out: a. Try square. b. Pencil. c. Rule d. Gauges			
		chairs, stools, tables, etc. Saw timber to given length and width Use hand tools to make simple joint Plane timber to size by following the proper sequence: i. Plan the face side and mark ii. Plan face edge square to the face size and mark. Gauge to correct width and remove waste. Select tools for marking out: a. Try square. b. Pencil. c. Rule d. Gauges e. Compasses			
		chairs, stools, tables, etc. Image: Constraint of the store of			
		chairs, stools, tables, etc. Saw timber to given length and width Use hand tools to make simple joint Plane timber to size by following the proper sequence: i. Plan the face side and mark ii. Plan face edge square to the face size and mark. Gauge to correct width and remove waste. Select tools for marking out: a. Try square. b. Pencil. c. Rule d. Gauges e. Compasses			

Construct the following joints:		
a. Bare-faced mortised and tenon		
joints		
b. Butt jointsc. Dowelling		
d. Housing joints		
e. Dovetailed joint		
f. Carry out the following operations:g. Pocket screwing		
h. Counter-boned screwing and pelleting Rebating and mitring.		
Design and prepare production drawings of chosen model.		
Prepare cutting list from nominal sizes to finish sizes e.g. legs, top rails, stretcher rails, tops, etc.		
Select and mark out joints e.g. mortise and tenon joint, dowelling, tongue and groove, pocket		
screwing and counter-drilling with nails bits.		
Produce the required joints		
Assemble the units with adhesives and fasteners		

		Assemble components.		
		Finish with French polish, spray or paint by hand brush, etc.		
		Prepare the wood surface for finishing by scrapping, sandpapering.		
		Apply wood finish by hand		
8	Furniture Design and Construction III (CFC 13)			
9 Upholstery Design and Translate pictorial drawings into production drawings.				
	Construction (CFC 12)	Interpret blueprints.		
		prepare blueprints.		
		Select and prepare cutting list from nominal to finished sizes; arm front and back, arm top, arm bottom,		
	_	back top and bottom, seat front, spring or web bearer, seat sides, side and back panels (arm).		
		Use templates for marking out and shaping of necessary parts on the band-saw machine, dowelling,		
		butt joints, mortise and tenon joint with fasteners.		
		Assemble backrest, armrest and the seat separately.		
		Remove arise where necessary		
		Apply preservatives to the assembled parts.		
		Select springs and webs e.g. single cone, double one, serpentine (zigzag) helical, tension spring, rubber, canvass, jutes, etc.		
		Identify and compare the properties of upholstery and bedding fittings, e.g. latex foam, plastic foam, natural fibres, synthetic fibres.		
		Identify and use hand tools used in upholstery work e.g. hammer, scissors, webstretcher, needles and awls, ripping, chisels, mallet staple, knife, measuring tape rule.		
		Demonstrate the operational principles and use of the following power hand tools, stapling gun (pneumatic and electric), powered cutters, electric iron, foam cutter drills (pneumatic and electric),		
		bottom mould.		
		Cut fabric and leatherette to size and shape as per template.		
		Identify the parts of a sewing machines 3.3 Identify and attach the following: pipe foot, gathering		
		foot, zip fastener foot.		
		Select the correct type of needle and thread for given kinds of materials.		
		Adjust the sewing machine to suit the fabric or leatherette		
		Sew, pipe and hem the fabric or leatherette to size and shape.		
		Stretch fabric or leatherette to remove arises and tack them.		

Check for correct fitting
Assemble the parts e.g. arm rest to seat and back
Cover bottom and fix castors and guide.
Design and upholstered furniture e.g. Arm chair, poof etc.
Apply webbing, e.g. spacing, weaving, etc.
Demonstrate knowledge of spring lacing, stitching, stuffing and burlap.
Cut and sew to patter.
Cover with fabric or leatherette, etc., observing Y-cut, notching, etc.

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