



Republic of Rwanda
Ministry of Education



RTB | RWANDA
TVET BOARD

WOOD JOINTS CONSTRUCTION

WOTJC301

CONSTRUCT WOOD JOINTS

Competence

RQF Level: 3

Learning Hours



Credits: 4

Sector: Agriculture and Food Processing

Trade: Wood Technology

Module Type: Specific

Curriculum: AFPWOT3002- TVET Certificate 3 in Wood Technology

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Issue Date: June 2022

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Purpose statement	This module describes employable and practicable skills, knowledge and right attitudes required by the student to prepare tools, materials and equipment for wood joint construction, join and adjust pieces for fitting and fix joint for permanent assembly. The contents provided in this course are packages reserved for a student pursuing TVET certificate III in wood technology. Graduates at this level will have knowledge and skills for initial work, community involvement and/or further learning.					
Delivery modality	Training delivery		100%	Assessment	Total 100%	
	Theoretical content		30%	Formative assessment	50%	
	Practical work:		70%			70%
	• Group project and presentation	20%				
	• Individual project /Work	50%				
		Summative Assessment		50%		

Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Prepare tools, materials and equipment for joint	1.1. Types of joints are correctly identified in accordance with their classes.
	1.2. Types of joints are correctly sketched by respecting the drawing standards
	1.3. Tools and equipment are correctly selected according to the type of the joint
	1.4. Joints are precisely marked out according to their types
	1.5. Materials are properly prepared in accordance with the joint to be constructed
2. Join and adjust pieces for fitting	2.1. Pieces of the joint are accurately cut according to the marking out.
	2.2. Joint is correctly fitted and without gaps in the joint
	2.3. Angles are accurately respected as provided in the given sketch
	2.4. Measurements are accurately respected and specified in the sketch provided
3. Fix joint for permanent assembly	3.1. Clamping devices are correctly applied and secure.
	3.2. Joint is strongly tightened according to the joints standards
	3.3. Joint is strongly connected as indicated in the sketches
	3.4. Wood Glue is correctly applied according to the type of the joint
	3.5. Angles are accurately respected as provided in the given sketch

Course content

Learning outcomes	At the end of the module the learner will be able to: <ol style="list-style-type: none">1. Prepare tools, materials and equipment for joint2. Join and adjust pieces for fitting3. Fix joint for permanent assembly
Learning outcome 1: Prepare tools, materials and equipment for joint.	Learning hours: 10

Indicative content

- **Identification of types of joints**

- ✓ Classes of joints:

- ✚ Lengthening:

- Half lapped
- Scarfed joints
- Fished Joints
- Spliced joint
- Splayed lap joint
- Bolted joint
- Joining plates
- Biscuit joints
- Dowel joint

- ✚ Widening:









- Rebate,
- Tongue and groove,
- Edge to edge butt joint
- Edge dowel joint
- Groove and feather or tongue
- Biscuit joint

- ✚ Framing:

- Mortise and tenon
- Halving joints
- Housing or dado joints
- Dovetail joints
- Finger joints
- Miter joints
- Biscuit joints

- **Sketching types of joints**


- ✓ Marking symbols
- ✓ Views
- ✓ Sections

- **Preparation of tools and equipment**
 - ✓ Preparation techniques of hand tools and machines
 -  Selecting
 -  Setting
 -  Sharpening
- **Marking out joints**
 - ✓ Datum face
 - ✓ Thickness of the joint
 - ✓ Depth of the joint
- **Preparation of materials**
 - ✓ Selection of materials depending on type of joint
 - ✓ Preparation techniques of timber:
 -  Marking
 -  Planing
 -  Ripping
 -  Cross-cutting
 - ✓ Preparation of adhesive materials: (dilution techniques)
 -  Wood glue






Resources required for the learning outcome


Equipment	<ul style="list-style-type: none"> • Surface planer • Thickness planer • Table saw machine • Tenoning machine • Mortising machine • Miter saw machine • Belt sander machine • Band saw machine • Spindle moulding machine
Materials	<ul style="list-style-type: none"> • Varnish • Wood glue • Timber • Sand paper • Bolts and nuts • Nails • Screws • Mechanical connectors

	<ul style="list-style-type: none"> • Dowels • Biscuits
Tools	<ul style="list-style-type: none"> • Clamps • Mallet • Hand saw • Jack plane • Chisel • Rasps • File • Pencil • Marking gauge • Try square • Scales • Catalog/Manuals
Facilitation techniques	<ul style="list-style-type: none"> • Group discussion • Trainer guided • Group work practices • Brainstorming
Formative assessment methods	<ul style="list-style-type: none"> • Written assessment • Performance assessment

Learning outcome 2: Join and adjust pieces for fitting	Learning hours: 20
Indicative content	
<ul style="list-style-type: none"> • Cutting pieces of joint <ul style="list-style-type: none"> ✓ Use of cutting tools ✓ Use of machines • Fitting joint <ul style="list-style-type: none"> ✓ Methods of fitting • Angles accuracy verification <ul style="list-style-type: none"> ✓ Try square ✓ Sliding bevel • Other measurements accuracy verification <ul style="list-style-type: none"> ✓ Measuring techniques: <ul style="list-style-type: none">  Checking diagonals ✓ Measuring principles 	
Resources required for the indicative content	

Equipment	<ul style="list-style-type: none"> • Table saw machine, • Mortise machine, • Tenoning machine, • Spindle moulder machine • Band saw machine • Jig saw machine • Miter saw machine
Materials	<ul style="list-style-type: none"> • Joint pieces, • Sand paper
Tools	<ul style="list-style-type: none"> • Try square, • Sliding bevel, • Hand saw, • Chisels, • Rasps • Files • Scales • Mallet • Clamps
Facilitation techniques	<ul style="list-style-type: none"> • Practical exercise • Brainstorming • Trainer guide • Group discussion
Formative assessment methods	<ul style="list-style-type: none"> • Written assessment • Performance assessment

Learning outcome 3: Fix joint for permanent assembly	Learning hours: 10
Indicative content	
<ul style="list-style-type: none"> • Application of fasteners <ul style="list-style-type: none"> ✓ Methods of application ✓ Hardening time of glue • Connecting joints <ul style="list-style-type: none"> ✓ Connecting symbols • Clamping devices <ul style="list-style-type: none"> ✓ Types of clamping devices <ul style="list-style-type: none">  Sash clamps  G clamps  F clamps  Hydraulic clamps ✓ Clamping principles <ul style="list-style-type: none">  Edge clamping 	

 Face clamping

- **Verification of angles accuracy**
 - ✓ Try square
 - ✓ Sliding bevel

Resources required for the indicative content

Equipment	<ul style="list-style-type: none">• Hydraulic clamp, impact drill
Materials	<ul style="list-style-type: none">• Wood glue; Pieces of joint, fasteners
Tools	<ul style="list-style-type: none">• Clamps, try square, sliding bevel, mallet, hammer
Facilitation techniques	<ul style="list-style-type: none">• Demonstration and simulation• Individual and group work• Practical exercise• Trainer guided• Group discussion
Formative assessment methods	<ul style="list-style-type: none">• Written assessment• Performance assessment• Product assessment

Integrated/Summative assessment (For specific module)

Integrated situation

The lead technician of the workshop of the company is looking for Joiners to prepare the joints for a standard chair with a panel sit and joints for a tie beam. As a qualified joiner, you are requested to construct required joints for one standard chair with a sitting panel, and one tie beam of 8m x10cmx5cm. The joints to be prepared are widening, framing and lengthening joints. The timber to be used is Libuyu (African Mahogany). The given tasks are to be performed in the following times:

- Making the joints required to make a standard chair in 4hrs maximum and
- Making the joints required to make a Tie beams in 2hrs maximum

The tasks are described as follows:

- ✓ Prepare tools, materials and equipment for joint
- ✓ Join and adjust pieces for fitting
- ✓ Fix joint for permanent assembly

NB: Drawing, materials, tools and equipment are available in the workshop.

Resources

Tools	<ul style="list-style-type: none">• Jack plane
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	<ul style="list-style-type: none"> • Tape measure • Try square • Hand saw • Tenon saw • Chisel • Pencil • Clamps • Rasp • Claw hammer • Spanners • Mallet • Screwdriver • Clamps
Equipment	<ul style="list-style-type: none"> • Surface planer machine • Thickening machine • Circular saw • Screwing machine • Drill machine • Sanding machine • Tenoning machine • Mortising machine
Materials/ consumables	<ul style="list-style-type: none"> • Mahogany timber • Nails • Screws • Wood glue • Sanding paper • Sanding block

Assessable outcomes	Assessment criteria (Based on performance criteria)	Indicator	Observation		Marks allocation
			Yes	No	
Learning outcome 1: Prepare tools, materials and equipment for joint (40%)	1.1. Types of joints are correctly identified in accordance with their classes.	Types of joints are correctly identified			15
	1.2. Types of joints are correctly sketched by respecting the drawing standards	Types of joints are correctly sketched			7
	1.3. Tools and equipment are correctly selected according to the type of the joint	Tools and equipment are correctly selected			6
	1.4. Joints are precisely marked out according to their types	Joints are precisely marked out according to their types			6
	1.5. Materials are properly prepared in accordance with the joint to be constructed	Materials are properly prepared			6
Learning outcome 2:	2.1. Pieces of the joint are accurately cut according to the marking out.	Pieces of the joint are accurately cut			15

Join and adjust pieces for fitting (40%)	2.2. Joint is correctly fitted and without gaps in the joint	Joint is correctly fitted			9
	2.3. Angles are accurately respected as provided in the given sketch	Angles are accurately respected as provided in the given sketch			7
	2.4. Measurements are accurately respected and specified in the sketch provided	Measurements are accurately respected and specified in the sketch provided			6
Learning outcome 3: Fix joint for permanent assembly (20%)	3.1. Clamping devices are correctly applied and secure.	Clamping devices are correctly applied and secured.			4
	3.2. Joint is strongly tightened according to the joints standards	Joint is strongly tightened according to the joints standards			4
	3.3. Joint is strongly connected as indicated in the sketches	Joint is strongly connected as indicated in the sketches			4
	3.4. Wood Glue is correctly applied according to the type of the joint	Wood Glue is correctly applied according to the type of the joint			4
	3.5. Angles are accurately respected as provided in the given sketch	Angles are accurately respected			4
Total marks		100			
Percentage Weightage		100%			
Minimum Passing line % (Aggregate): 70%					