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CABINET MAKER

Learner Guide

National Vocational Certificate Level 3

Version 1 - January 2020

NAVTTC

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Contents

Introduction

Welcome to your Learner's Guide for the *Cabinet Maker* Program. It will help you to complete the program and to go on to complete further study or go straight into employment.

The *Cabinet Maker* program is to engage young people with a program of development that will provide them with the knowledge, skills and understanding to start this career in Pakistan. The program has been developed to address specific issues, such as the national, regional and local cultures, the manpower availability within the country, and meeting and exceeding the needs and expectations of their customers.

The main elements of your learner's guide are:

- **Introduction:**
  - This includes a brief description of your guide and guidelines for you to use it effectively
- **Modules:**
  - The modules form the sections in your learner's guide
- **Learning Units:**
  - Learning Units are the main sections within each module
- **Learning outcomes**:
  - Learning outcomes of each learning units are taken from the curriculum document
- **Learning Elements:**
  - This is the main content of your learner's guide with detail of the knowledge and skills (practical activities, projects, assignments, practices etc.) you will require to achieve learning outcomes stated in the curriculum
  - This section will include examples, photographs and illustrations relating to each learning outcome
- **Summary of modules**:
  - This contains the summary of the modules that make up your learner's guide
- **Frequently asked questions**:
  - These have been added to provide further explanation and clarity on some of the difficult concepts and areas. This further helps you in preparing for your assessment.
- **Multiple choice questions for self-test**:
  - These are provided as an exercise at the end of your learner's guide to help you in preparing for your assessment.

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Module-9

Module 9: Prepare Joints Manually

Objective: This module covers the skills and knowledge required to Perform Ripping, Perform Cross Cutting, Perform Curve Cutting, Perform Surface Plaining, Perform Edge Plaining, Perform Size Plaining and Make Joints Manually.

Duration: 100 **Theory: 20** **Practice: 80**

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
LU1. **Perform Ripping**	***Trainee will be able to:*** • Identify hand wood cutting tools. • Select hand saw as per job requirement. • Hold/Fix wood in the wood working vice • Cut the wood along the grain	• Basics of Measuring & Measuring Tools • Kinds of wood Saws • Knowledge of Wooden files & rasps • Knowledge of boring tools • Knowledge of Mallets & Hammers	
LU2. Perform Cross Cutting	***Trainee will be able to:*** • Select hand saw for cross cutting • Hold/Fix work piece in the work bench hook. • Cut the wood across the grain	• Function of different wood saws. • Knowledge of wood grains. • Techniques of cross cutting	
LU3. Perform Curve Cutting	***Trainee will be able to:*** • Identify tools for curve cutting • Select hand saw for curve cutting • Cut the wood as per design/ line	• Knowledge of Marking & Layout Tools • Techniques of curve cutting.	
LU4. Perform Surface Plaining	***Trainee will be able to:*** • Identify tools for Surface Plaining • Select hand planer as per job. • Fix the job on work bench for surface Plaining • Plane the surface	• Kinds and functions of different Plains • Techniques of surface plaining.	

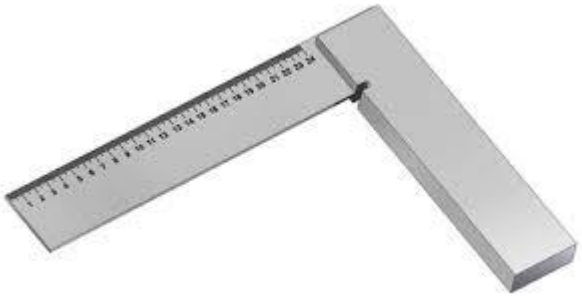
LU5. Perform Edge Plaining	***Trainee will be able to:*** • Identify tools for Edge Plaining • Select planer as per job. • Fix the Job on work bench vice • Plane the Edge at right angle	• Techniques of edge plaining.	
LU6. Perform Size Plaining	***Trainee will be able to:*** • Identify tools for Size Plaining • Select planer as per job. • Fix the job on work bench for size plaining • Plain the surface for the desired thickness • Plain the edge for the desired width	• Techniques of size plaining	
LU7. Make Joints Manually	***Trainee will be able to:*** • Select Marking/Cutting tools • Perform Marking on job • Hold the job in the vice of work bench. • Cut the job as per joint requirement • Perform chiseling as per joint requirement • Perform drilling in the job for dowel. • Perform grooving as per joint requirement • Assemble all pieces to test the accuracy	• Knowledge of chisels • Kinds of Joints ➢ Lap Joints ➢ Mortise & Tenon Joints ➢ Dovetail Joints ➢ Pin Joints ➢ Dado joints ➢ Tongue & Groove Joints ➢ Knock Down Joints ➢ Biscuit Joint ➢ Dowel Joint ➢ Domino Joint ➢ Cross Bar Joint ➢ Rabbet Joint	

Example and Illustrations:

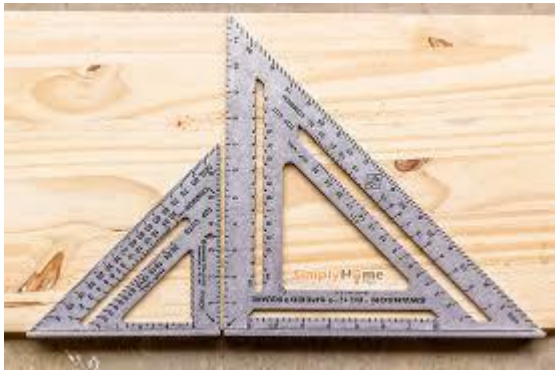
Measuring Tools:

A measuring tool is anything used to take a count of quantitative data, such as weight, length, time or temperature.

Measuring Tools	
Tape Measure. a long, thin piece of plastic, cloth, or metal that is marked with units of length (such as inches or centimeters) and that is used for measuring things	
Framing square. • use to measure/check a "square edges" or right- angle • Blade-24''	

Try square. used for marking and measuring a piece of wood to check its straightness or correspondence to an adjoining surface	
Combination square • is a tool used for multiple purposes in woodworking • used to lay out or check right and 45° angles	
Sliding T-bevel • false square • is an adjustable gauge for setting and transferring angles	

Level device for establishing a horizontal plane. It consists of a small glass tube containing alcohol or similar liquid and an air bubble	
Ruler • simplest and most common measuring tool • used for measuring distances and ruling straight lines	

Calipers is a device used to measure the distance between two opposite sides of an object. A caliper can be as simple as a compass with inward or outward-facing points. **Inside Caliper** used to measure the internal size of an object **Outside Caliper** used to measure the external size of an object **Divider Caliper** use to measure point to point or divide equal distance between points.			
Folding Rule • for measuring and setting down dimension • windows, frames and doorways.			
Triangle • A three-sided ruler • Use to draft triangle and measure angle			

Different Types of Hand Saws

There are a few saws that are generally used to just cut wood materials into pieces. While you might need something with additional capabilities, these saws have a place in everyone's tool inventory.

1. Hand saw A basic handsaw is a staple for home toolboxes. With a basic handsaw, you can cut wood or fiberglass. It's not a precision tool though; if you need to cut something to specifications, you'll need to upgrade your inventory. If you just need to cut the odd log, however, it'll do that work nicely. Most of these types of saws are meant for woodworking, but some of them can also cut other material such as drywall and bone.	
2. Hack-saw If you need to cut something harder than wood, you'll need to go with a hacksaw. Most people associate these with cutting metal. But if you need to, say, cut a frozen bone, the hacksaw will be your saw of choice.	
3. Crosscut saw Better known as a lumberjack saw, this two-person saw is ideal for cutting large logs into smaller pieces for moving. If you get this tool, make sure you keep the teeth sharp; hardwood trees can quickly dull them, increasing your work time.	

4. Pruning saw Sometimes you can find pruning saws mounted to the end of poles for working on tree limbs, but as a hand tool, it's great for reaching low-hanging branches or a line of dense vines. You can replicate this type of work with certain chainsaws, but a hand tool offers precise results.	
5. Bow saw The closed-loop of the bow saw ensures quick and efficient cuts through dense wood, especially with a sharp blade.	
6. Camping saw When you go camping, space and weight are premium assets. This is where a camping saw comes in handy. This type of saw is small and lightweight, which means that it will not be a burden to carry. Do consider that the size of the wood you'll be able to cut, will be limited by the size of your saw. That said, large logs usually produce smaller limbs and branches that you'll have access to.	

7. Japanese saw Unlike traditional Western saws that rely on the pull, these unique saws rely on the push strike. Their small, sharp teeth can move quickly through wood, but the size of the wood you can work with is limited by the hardened spine at the top of the blade.	
8. Fret saw The fret saw's thin blade and high back make it ideal for making angled or curved cuts in thin pieces of wood. Don't try using this saw on anything dense or thick; this is best for paneling or thin plywood.	

9. Back-saw The thick spine along the top of the backsaw means that the blade is stable and well supported for the entire cut. In other words, you'll maintain control throughout the entire process because the blade won't bend halfway through a piece of dense wood.	
10. Keyhole saw With a dagger-like point on the front of the blade, the keyhole saw is designed to poke through soft materials like drywall and paneling so that it can cut larger holes. This isn't a precision saw, but it can create a rough starting point for another tool with better accuracy.	

11. Wallboard saw Designed specifically for cutting drywall, the wallboard saw is about creating holes for things like electrical outlets and utility plugs. It's sharp enough to not rip chunks out of the drywall as it cuts through it, but it's not stiff enough for use on wood beyond paneling.	

Files and Rasps

A common mis understanding we make while discussing hand tools is to consider a file and a rasp as the same thing. Although both of these tools perform similar tasks, each one performs a specific type of function. The primary difference between a rasp from a file is that rasps are primarily for wood, but files are for metal.

The distinguishing feature of **files** is that long teeth run across their width. You can get “straight-cut” files with only parallel teeth, or “cross-cut” files with opposing angles.

Rasps serve a greater purpose in a woodworking shop than rifflers or files. You may wonder why this is so. The reason is that the teeth of a rasp have a mountain peak-shaped profile which allows for an aggressive cut but will not rip the material. Unlike a file or a riffler, a rasp has less tendency to clog up. This makes a rasp the preferred choice when it comes to working on wood.

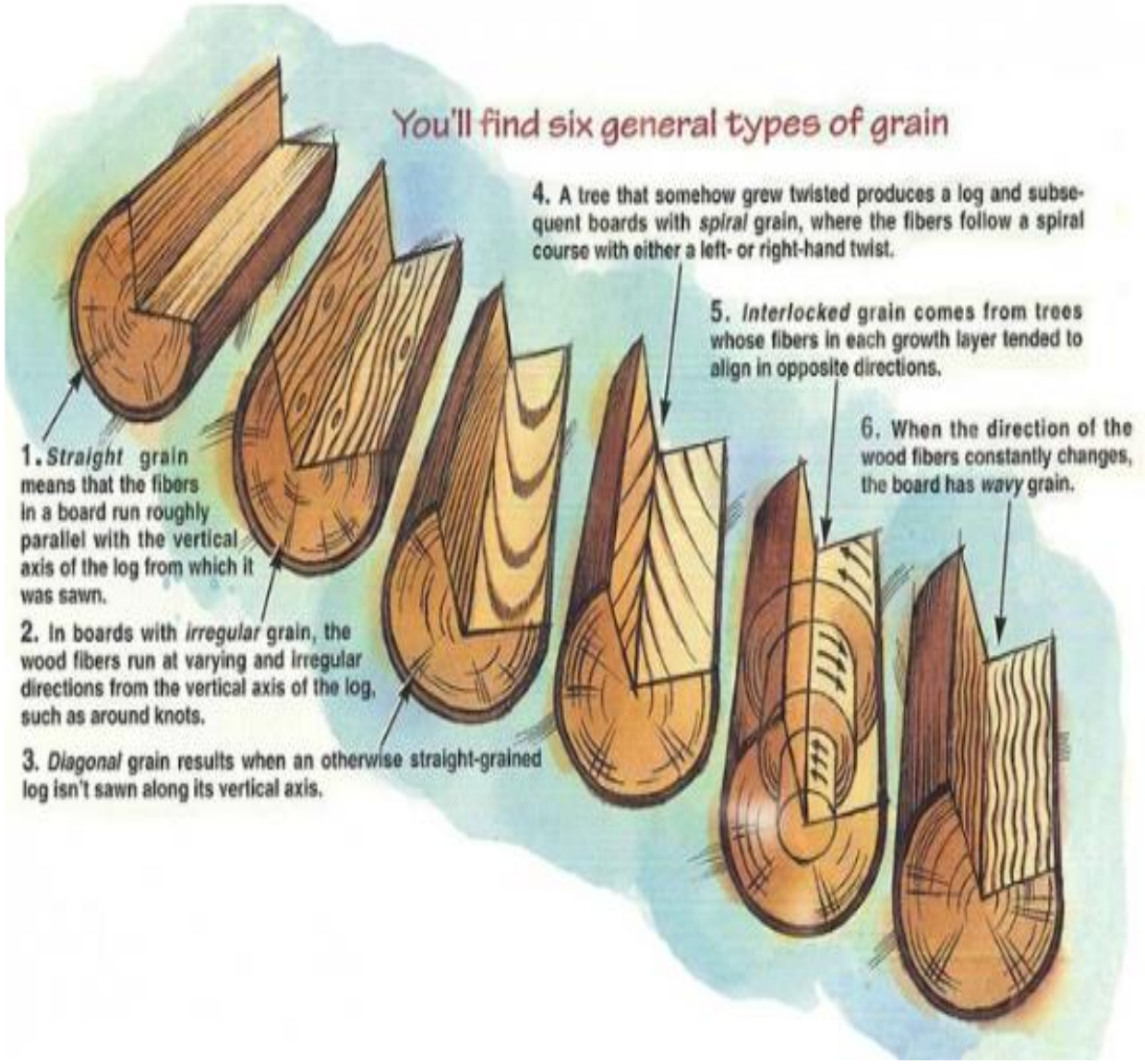
We get rasps in different grades of coarseness and sizes to suit different jobs. Hence, you will get excellent performance for controlled cutting, shaping, carving, easing edges, and so on. The randomly-spaced teeth of some of the better rasps will give you a smoother action and better cutting control.

Understanding Wood Grain

A craftsman selects a certain type of wood for a project because of a number of reasons. Grain is one. Yet that word has many meanings.

Technically, the word grain refers to the orientation of wood-cell fibers. That's quite different from figure, which describes the distinctive pattern that frequently results from various grain orientations. To understand this, it may help to think of the word direction following the word grain. All grain types except straight grain can be a blessing or a curse. Because wood with anything other than straight grain may be sawn to produce sometimes exquisite figure, errant grain becomes a blessing. In structural applications, such as home construction, lumber (mostly softwood) with other than straight grain loses some strength. And hardwood boards without straight grain require extra care in machining to avoid tear out and other reactions.

Grain Means texture, too. Texture means the relative size as well as the amount of variation in size of the wood cells. It's the cells and how they're arranged in bands called rays, and the size and distribution of pores, that make the difference between fine-textured wood and coarse-textured wood. Woodworkers, though, say "fine-grained" and "coarse-grained" rather than use the word texture to describe this characteristic of wood. And you don't have to be a wood technologist to see as well as feel the difference in grain.



Ripping and Cross Cutting:

With the **rip cut**, you cut along the grain; while with the **cross cut**, you cut across the grain.

Cutting along the grain is a very easy cut; even before you had mechanical saw, you had saws with few but large teeth so you cut as fast and as straight as possible. Essentially, you "rip" the wood apart, like you can split it with an axe, except you'll get a straighter cut as you may still cut some of the wood fibers. This cut has a tendency to bind the blade as the wood fiber relax.

Cutting across the grain is much harder for the saw (you need to cut a lot of fibers), and you typically use a saw with smaller teeth, but many more of them.

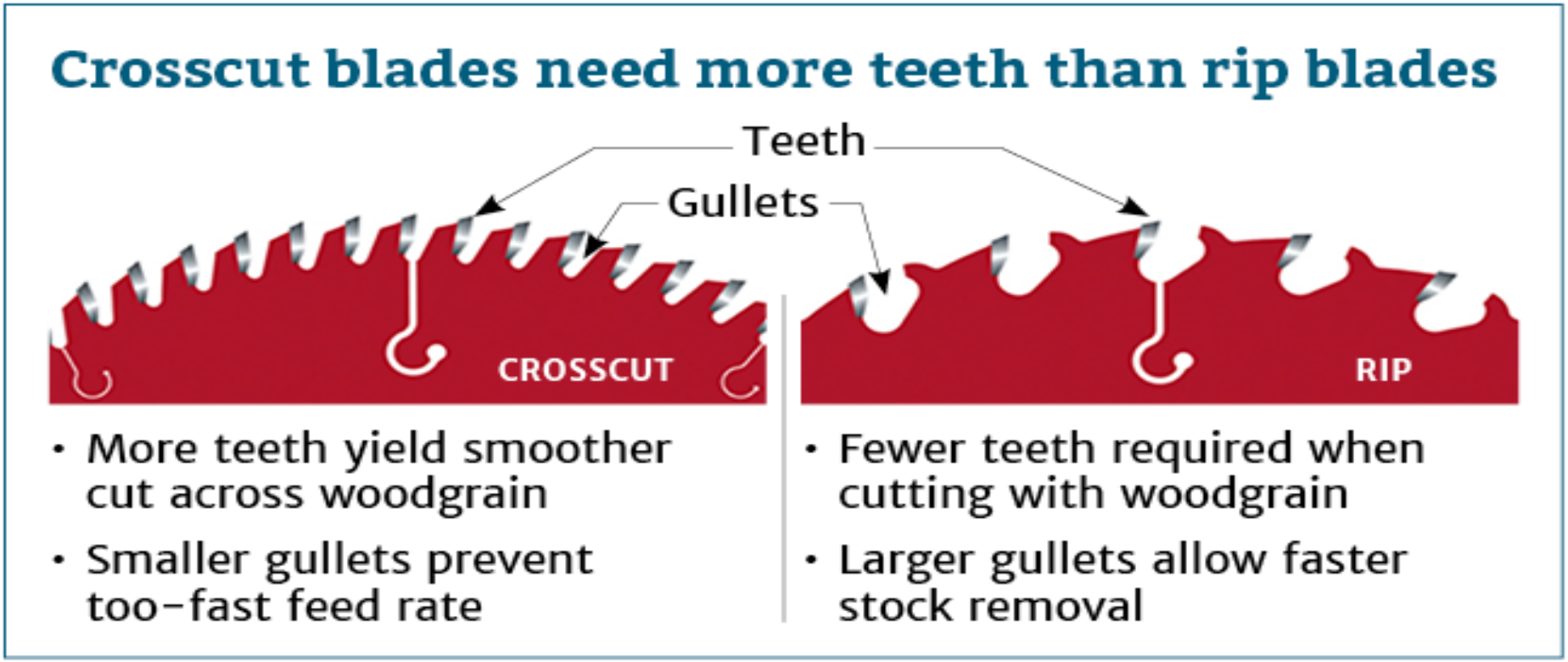


Image comes from http://www.rockler.com/how-to/blades-101/

Curve Cutting

Woodworking can be fun, especially since you cut, sand, and make wood look exactly how you want it to. Cutting wood for use in woodworking isn't that hard, especially if you have the right tools to use. You can make simple marks and even finer patterns using expert techniques. But certain designs are a little more complicated than you're used to.

One such design involves cutting curves in wood. But with the right technique and tools, you can master the art of doing so quickly and deliver first-class results. Here are three techniques that you can employ when cutting curves in wood

Circular Saw Technique

The secret to cutting wood in a circular pattern is to make sure you're using the right tool. Typically, a jigsaw is what comes to your mind when you realize you need a tool to cut curves. But the truth is, you don't always need a jigsaw for that. Instead, you can use a circular saw. A circular saw will help you cut curves in wood.

It's simple, quick, and easy to do so in a smooth curve. However, it is specialized for rough curves. The technique is to make sure the curve is gradual enough that the blade doesn't bind. The thinner the material you're cutting, the sharper the curve can be. You have to set the blade depth to ensure it barely projects through the bottom of the wood.

Sand Tight Curves

To make tight curves, you can use a random orbital sander. Line up the pieces of wood you're using. Clamp them together and sand the curves with a belt sander or random orbital sander. The trick is to stack several identical curved parts and sand them all at once. This will ensure that all of them will match perfectly, which will help you save time.

Now, if the parts require a lot of sanding, you can use a belt sander. But if you don't need to remove much wood, go with a random orbital sander. Ultimately, the key to success is to keep the sander moving at all times to avoid creating any flat spots and running your hand over the parts.

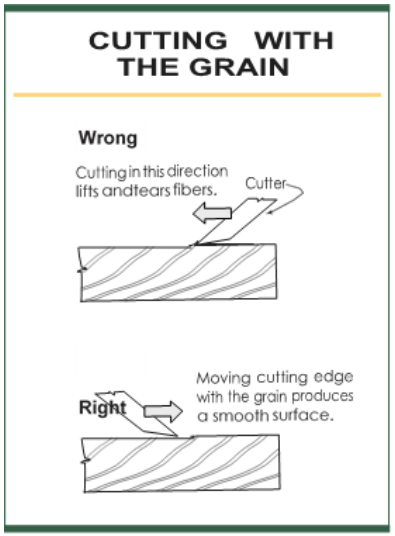
Pattern and Router for Irregular Curves

When it comes to irregular curves, you can use a pattern and router. How do you go about doing this? First, you have to trace and make a rough cut of your part. Then you can attach the pattern with hot melted glue. Once done, you can go ahead and move the router counterclockwise around the pattern.

You should take note of these tips for routing with a pattern bit. First, use a pattern to mark the shape. Using a jigsaw or band saw, remove excess material by cutting about one-fourth to one-eighth inches outside the lines. You can elevate the piece you're working on to avoid cutting into your desk or workbench. You can use hot melted glue or scraps of wood. Now, if you're cutting material that's thicker than the pattern, feel free to cut as deep as you can. Finally, you can remove the pattern and use that part to complete the cut.

Wood Plaining:

Working with the Grain

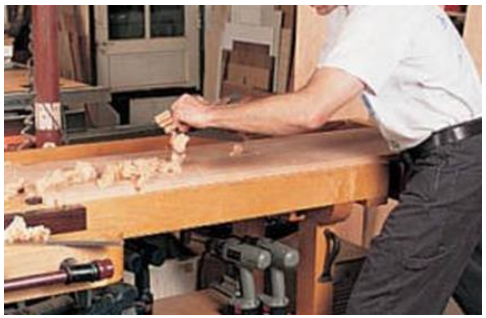


Working with solid wood demands that you pay attention to the direction of the wood's fibers, or grain. When you cut with the grain, such as when routing, plaining, or even sanding, you'll produce smoother surfaces. Cutting against the grain pulls and lifts the wood fibers up, resulting in tear out, or a rough surface. Take the time to study the grain patterns in your boards to determine which direction to orient them for cutting. Most of the time, you can see the grain rising or falling by looking at the edge of a board. But certain woods can fool you. Sometimes you can pass your fingers along the long-grain surface in both directions and feel which direction is smoother. The technique is very much like stroking the fur of a cat. The final test is to cut the wood itself. If it tears, cut from the opposite direction.

Smoothing with Edge:

Tools Boards straight from the thickness planer or jointer (or the lumberyard) aren't smooth enough for furniture. Small mill marks usually tiny ridges and hollows left by the rotation of a cutter head's knives. You can sand out these marks with a belt sander or a random Orbit sander.

To remove marks and smooth any imperfections, a hand plane is fast and efficient and leaves a flat, gleaming surface unsurpassed by any other tool. If you're working with a flat surface, such as a long, wide board, clamp it to a flat surface such as your benchtop. If you try to plane on an out-of-flat surface, the plane will skip and skitter over small humps and valleys.



Assuming your work has been accurately thickness planed, use a no. 4 or no. 5 plane for the initial smoothing. Make sure your plane iron is razor sharp and set the depth for a fine cut. Body English is all-important when plaining.

To gain leverage, spread your feet apart, hold the plane directly in line with your wrist and shoulder, and use your legs to power the stroke. Plane in one smooth, decisive movement, letting your upper body pivot over the work as you push the plane.

You should be able to plane a board about 5 ft. long without taking a step or moving your feet and without huffing to catch your breath. Proper hand plaining is a fluid, enjoyable action. For longer boards, take several passes by landing and taking off the plane from the surface, just like an air- plane. This technique helps avoid stop and start marks.

From time to time, check your progress with a straightedge to ensure the surface is flat. If you detect a small hollow that the plane has skipped over, try skewing the plane to the direction of the cut to effectively reduce the length of the sole. If the wood is difficult and starts to tear, plane in the opposite direction. Sometimes it's quicker simply to reverse the plane and pull it rather than to reposition the board.

14 Types of Wood Joinery

https://woodworkingpeople.com/woodworking-joints/

Woodworking joints are useful in woodworking. It is one of the basics that you have to learn, practice and master. It can give you the ability of joining wood together and still come up with excellent results for every project.

1. Mitered Butt Joint

Almost of the same concept as a butt joint, but this wood joint involves two pieces of wood board joined not square to one another but at an angle. It is more pleasing to the eyes than the basic butt joint because it does not display the wood's end grain. On a drawback, this joint isn't durable.

2. Biscuit Joint

It is another method of joining wood pieces in order to create lovely wood projects. The technique is a modern approach in wood joinery and is a favorite among those that want to create an elegant tabletop using glue as well as on the Beachwood 'biscuit' that will keep the boards in place.

3. Half-Lap Joint

You will easily distinguish it with two joined boards removed in order that they join but flushed with each other. It is a favorite among woodworkers, but then note that it might weaken two boards adjoined. On a good note, it is stronger than a basic butt joint.

4. Tongue and Groove Joint

It is a stronger joint that you can depend on better when trying to adjoin surface areas. Woodworkers commonly use it when trying to glue the wood joint.

5. Bridle Joint

It is another wood joinery to learn if you love woodworking. This joint is like the mortise and Tenon joinery, wherein you cut a piece of Tenon on one piece's end and then cutting a mortise on the other wood piece that will accept the Tenon.

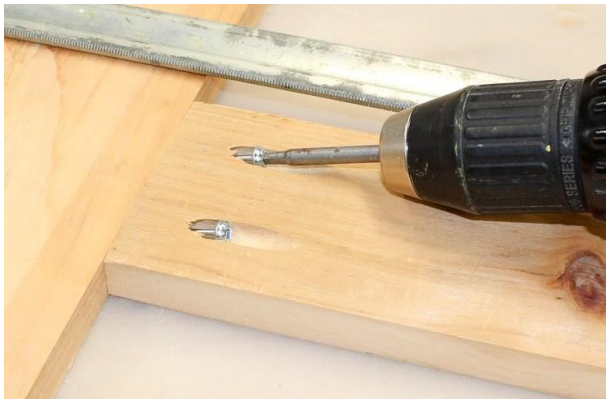
This joint is used to hold a rail, such as legs, in uprights, providing it strength from compression. The joinery type is also resistant to racking. Here, you will need a mechanical pin or fastener.

You can use corner bridles if you're looking to joint several frame pieces when each of them is shaped. And without sacrificing its integrity, you can remove a material from the joined pieces following assembly.

6. Butt Joint

It is a product of combining two wood butts together, commonly resulting to a right angle joined piece. It also appears to be square to the other board. Usually, this joint is fastened through mechanical fasteners and is used in wall framing on jobsites.

7. Pocket Joint



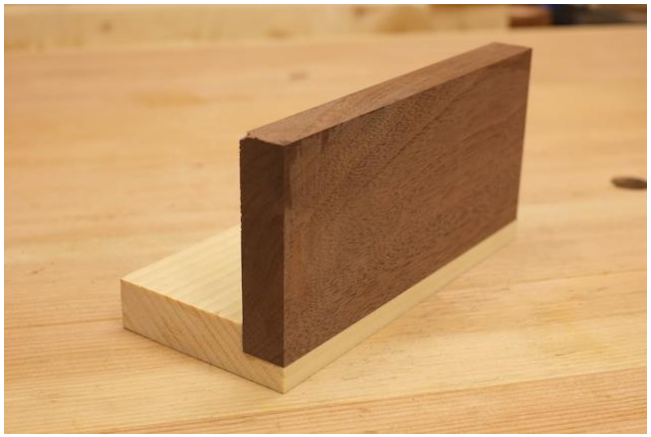
You can also make use of the technique involving pre-drilling one pilot hole and cutting one slot that will result to a joined wood at an angle between the two boards prior to connecting them using a screw. Take note, though that you need to be sure that what you pre-drilled is accurate.

You can achieve it using jig. When can you use this type of joint? You might want to opt for it when working with cabinet face frames or any other applications requiring less strength.

8. Dado Joint

You can easily spot it in woodworking projects for its notable square-grooved slot on one of its board in which another piece of board will be fitted. It is used mostly on connecting plywood especially when making cabinets.

9. Rabbet Joint



It is also used in building cabinetry in many homes. This join is also notable for its similarity to a dado cut located on the board's edge.

These joints can also be seen at the back of assemblies, including cabinets, for attaching to the box's sides. Rabbet can add strength to these types of assemblies.

10. Dovetail Joint

It is known as one of the most sought-after wood joints, which look elegant and beautiful. The joint is also strong that it can be relied on for your wood projects.

It is also a chosen joint by many woodworkers because it can add a touch of elegance in their projects. However, you need to learn some techniques to come up with the joint, such as hand cutting or using a jig.

11. Sliding Dovetail

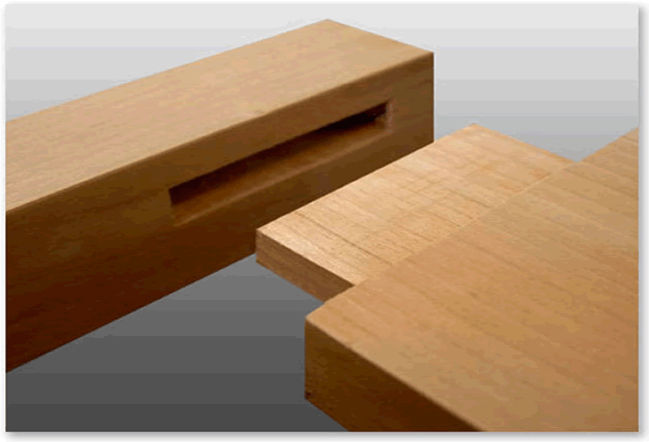
One of the best wood joinery methods to use is the sliding dovetail, which is also a common choice for its many uses. For many, it is also a good alternative for a locking dado joint.

12. Box Joint

Some woodworkers are using the box joint when they don't find using other joints practical. This joint is known to be a good alternative than using a dovetail joint.

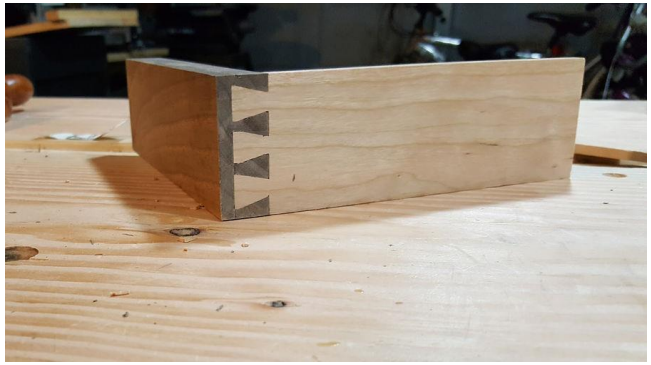
However, this type doesn't possess a dovetail's mechanical strength. This joint is easy to make by using a wood router with a jib or a table saw.

13. Mortise and Tenon Joint



One of the classics when it comes to wood joinery, it has been an old favorite among woodworkers from the start. Many loves it because it looks elegant and also a strong joint. When done correctly, you can achieve beautiful and tight joints for your project.

14. Half-Blind Dovetail Joint



There are instances when you have to hide both the dovetail's edges. You can notice this in a drawer or closet front. In this case, woodworkers won't want to see the dovetail on the front of the drawer.

This is the reason that many use a half-blind dovetail, which is a strong, elegant and clean joint that you can always count on.

CABINET MAKER

Learner Guide

National Vocational Certificate Level 3

Version 1 - January 2020

Module-10

Module 10: Perform Wood Cutting

Objective: This module covers the skills and knowledge required to Load log for cutting (by crane/manual), Cut slab with log band saw, Cut planks with log band saw, Stack planks for seasoning, Perform cross cutting of planks with Pendulum saw, Perform Pattern Cutting on Band Saw, Perform ripping of planks and Perform board cutting.

Duration: 100 Hours **Theory: 20 Hours** **Practice: 80 Hours**

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
LU1. Load log for cutting (by crane/manual)	***Trainee will be able to:*** • Check metal/stone pieces in log • Lift log with lifter vehicle • Balance the log on lifter • Transport log to machine trolley. • Unload log on machine trolley • Adjust log on trolley • Hold the log on trolley	• Loading/unloading techniques • Balancing techniques of log •	
LU2. Cut slab with log band saw	***Trainee will be able to:*** • Adjust machine for slab cut • Turn on the machine • Drive trolley in appropriate gear • Perform slab cutting	• Machine adjustment techniques for safe cutting of log • Operating techniques of Band Saw	
LU3. Cut planks with log band saw	***Trainee will be able to:*** • Follow the cutting list • Adjust machine for desired cutting. • Perform test cut for thickness. • Perform plank cutting • Remove the final slab.	•	
LU4. Stack planks for seasoning	***Trainee will be able to:*** • Identify location for planks stacking • Collect the planks.	• Understanding of stacking techniques • Types of seasoning; ➢ Air Seasoning	

	• Stack the planks for seasoning.	➢ Kiln Seasoning	
LU5. Perform cross cutting of planks with Pendulum saw	***Trainee will be able to:*** • Collect planks for cross cutting. • Perform first cut in right angle. • Adjust stopper for the desired length. • Perform cross cutting.	• Knowledge of cross cutting machines	
LU6. Perform Pattern Cutting on Band Saw	***Trainee will be able to:*** • Collect planks for pattern cutting. • Mark the piece as per pattern. • Select the required band saw blade. • Mount the blade. • Adjust tension of the belts. • Adjust tracking of the blade. • Adjust the Thrust bearing. • Perform pattern cutting.	• Knowledge of cutting blades • Safe Use of band saw	
LU7. Perform ripping of planks	***Trainee will be able to:*** • Collect planks for ripping. • Perform first cut for edge straightening. • Adjust fence for the desired width of planks. • Perform ripping.	• Knowledge of ripping machines • Function and adjustment techniques of fence/stopper.	
LU8. Perform board cutting	***Trainee will be able to:*** • Select board for cutting • Adjust fence for the desired width/length of board. • Perform ripping/cross cutting		

Example and Illustrations:

Lumber:

Dealing with lumbers is not an easy chore for any carpenter. To turn those bulky lumbar into usable boards, they go through a number of complicated cutting, sizing and finishes chores. So, you might pick up a way to cut them with a band saw mill. So, it's super important to follow the right process. It's quite important information to know what lumber sizes are able to be cut with a band saw. Usually, lumber and logs that lie within a diameter range of 16 to 18 inches are able to be cut under a band saw mill.

What is a slab?

Trees get cut into usable smaller pieces in three formats. Ordinary lumber is made by cutting a log into a variety of smaller pieces, with the mix chosen to maximize the yield of useful sizes:

Planks:

A plank is timber that is flat, elongated, and rectangular with parallel faces that are higher and longer than wide. Used primarily in carpentry, planks are critical in the construction of ships, houses, bridges, and many other structures. Planks also serve as supports to form shelves and tables.

Wood Seasoning:

Seasoning of timber is the process by which moisture content in the timber is reduced to required level. By reducing moisture content, the strength, elasticity and durability properties are developed. A well-seasoned timber has 15% moisture content in it. A piece of green wood, on exposure to atmosphere; loses moisture, and the rate of drying depends on the nature of timber, thickness of the piece, temperature, relative humidity and the rate of circulation of air around the piece.

Air Seasoning

In the process of air seasoning timber logs are arranged in layers in a shed. The arrangement is done by maintaining some gap with the ground. So, platform is built on ground at 300mm height from ground. The logs are arranged in such a way that air is circulated freely between logs. By the movement of air, the moisture content in timber slowly reduces and seasoning occurs. Even though it is a slow process it will produce well-seasoned timber.

Kiln Seasoning.

In this method timber is subjected to hot air in air tight chamber. The hot air circulates in between the timber logs and reduces the moisture content. The temperature inside the chamber is raised with the help of heating coils. When the required temperature is obtained moisture content and relative humidity gets reduced and timber gets seasoned. Even though it is costly process it will give good results strength wise.

CABINET MAKER

Learner Guide

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Module-11

Module 11: Perform Wood Plaining by Machine

Objective: This module covers the skills and knowledge required to Perform surface planning, Perform edge plaining, Perform plaining for desired thickness, Perform plaining for desired width and Cut to size (cross cutting).

Duration: 100 Hours **Theory: 20 Hours** **Practice: 80 Hours**

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
LU1. Perform surface planning	***Trainee will be able to:*** • Adjust safety guard of the machine • Adjust the out-feed table according to cutting edge of the cutter. • Adjust the depth of cut of in-feed table. • Feed the piece manually/feeder • Plane the surface.	• Understanding of jointer/plainer • jointer operations • Knowledge of blades • Setting for safe use of jointer/plainer	
LU2. Perform edge plaining	***Trainee will be able to:*** • Adjust fence at required angle. • Perform Test run for right angle • Adjust the in-feed table for required cut. • Plane the Edge.	• Use of fence/stopper • Feeding Speed	
LU3. Perform plaining for desired thickness	***Trainee will be able to:*** • Adjust table for the desired thickness of cut. • Adjust the required feeding speed. • Plain job for desired thickness.	• Setting of Thickness plainer • Operations of thickness plainer • Table adjustment techniques for the desired thickness of cut	
LU4. Perform plaining for desired width	***Trainee will be able to:*** • Adjust table for the desired width of cut. • Adjust the required feeding speed. • Plain job for desired width.	• Table adjustment techniques for the desired width of cut	

LU5. Cut to size (cross cutting)	***Trainee will be able to:*** • Select the required machine as per job. • Set the fence at required angle • Adjust the blade for required height. • Perform first end-cut in required angle. • Set stopper for the required length. • Cut the job as per desired length.	• Adjustment techniques of the in-feed table for the required cut	

Example and Illustrations:

Circular Saw Tips and Techniques

https://www.familyhandyman.com/tools/circular-saws/circular-saw-tips-and-techniques/

Proper blade depth

Setting the blade too deep causes a few problems. First, it's more dangerous than a correctly set blade because more blade is exposed while cutting. In addition, the saw is more likely to bind and kick back if the blade is too deep. Safety issues aside, blades cut more efficiently when properly set.

Before you pull the trigger

Determine the blade depth by unplugging the saw and holding it alongside your board with the blade guard retracted. Then loosen the depth-adjusting lever or knob and pivot the saw's base until the blade extends about 1/4 to 1/2 in. below the board. Tighten the lever or knob and you're ready to saw.

Avoid binding

Always make sure the end of the board you're cutting is free to fall or move away. For rough cuts in framing lumber, let the cut end fall. Be aware, though, that the falling piece can take a sliver of wood with it as the cut nears completion. To avoid this splintering when you're cutting boards for nicer projects, support the board continuously. But don't clamp, hold or otherwise restrict the cutoff piece

Plywood cutting technique

Crosscutting plywood without supporting it across its entire length can cause the saw to bind or the plywood veneer to tear or splinter as the cutoff piece drops. If you're using sawhorses, simply span them with a pair of 2x4s. This will provide the support needed.

Sanding Machine Techniques

https://www.bhg.com/home-improvement/remodeling/carpentry/how-to-use-a-palm-sander/

Step 1: Pick Your Paper

Decide which sandpaper is best for the job at hand. Typically, you start with a coarse grit, and then work your way up to finer papers. You'll need to examine the state of the wood to decide what grit is best. If the material is very rough, start with a coarse (40-60 grit) paper, then work up to a medium (80-120 grit) and eventually a fine (150-180 grit) paper. On the other hand, if your material is already in decent shape and you're trying to get an extra- smooth finish, start with a fine paper (150-180 grit) and work up to a very fine (220-240 grit) or extra fine (280-320 grit) paper.

Step 2: Measure and Attach Paper

Once you've decided on a grit, measure and cut the sandpaper to size. Insert the sandpaper by opening the sander's clamp lock, placing the paper, and tightening the clamp lock. Repeat on both sides to fully secure the sandpaper.

Step 3: Secure Material

Secure the material you're sanding to the work surface with clamps. Then turn on the sander and bring it up to full speed. Now is a good time to put on safety goggles and a mask. These tools will protect you from sawdust.

Step 4: Start to Sand

Place the sander on the surface and move it in long, even strokes. Make sure you're moving only back and forth in the direction of the sander and along the wood grain. Going against the grain Knicks the material, creates splinters, and ultimately defeats the point of sanding.

Step 5: Finishing Touches

Turn the sander off and switch sandpaper for one of a finer grit, as needed. Continue sanding and switching paper until project is finished. Wipe the wood of any sawdust with a tack cloth.

Band saw Cutting

https://www.familyhandyman.com/tools/saws/how-to-use-a-bandsaw-essential-bandsaw-tips-tricks/

Cut on the Outside Edge of the Line

Band saw cuts usually leave saw marks, so it's good practice to allow extra material for smoothing the edge. Cutting on the outside edge of the line minimizes the amount of material you have to remove. However, accurately following the edge of a line—especially a curved line—takes practice. So until you've mastered this skill, it's best to start far enough away to leave a bit of wood showing between the line and the saw kerf. Remember: An oscillating spindle sander (or a sanding drum chucked in your drill press) is a band saw's best friend.

Instant Zero Clearance

Here's an easy way to eliminate those annoying delays caused by offcuts getting jammed next to the blade in the saw's throat plate. Just cut a kerf in a piece of thin cardboard from a cereal box and tape it to the table.

Make Relief Cuts

Cutting a contoured profile is easier if you first cut in to the line along the curves and at the transition points. Then, when you saw the profile, the waste falls away whenever you reach one of these relief cuts. This frees the blade to continue and effectively reduces each contour to a series of short, manageable cuts.

Jointer:

Use a couple of rubber sponge floats to hold down boards on your jointer. Typically used in stucco work, sponge floats are available at home centers for about 6. They grip boards tightly, keep your hands far from the cutter head, and put a stop to vibration!

Thickness Planner

https://www.familyhandyman.com/tools/woodworking-tools/how-to-use-a-benchtop-planer/

In some cases, you'll be able to tell which end to feed into the planer by inspecting the grain (or to be precise, the direction of the fibers). When you're plaining the wide surface of the board, inspect the grain on the narrow edge. When you're plaining the edges, inspect the wide face. On rough lumber, you can feel the fibers by running your hand over the board. It will be smooth in one direction and rough in the other. Feed the smooth direction forward into the wood planer.

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Learner Guide

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Module-12

Module 12: Prepare Job on machine

Objective: This module covers the skills and knowledge required to Identify job as per drawing, Make Joints by machine, Perform Drilling/Boring, Perform Profiling/ shaping, Perform Turning on Wood Lathe, Perform Lipping, Perform Sanding and Install Hardware (Woodworking).

Duration: 100 Hours **Theory: 20 Hours** **Practice: 80 Hours**

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
LU1. Identify job as per drawing	***Trainee will be able to:*** • Select the drawing/cutting list • Interpret drawing/cutting list • Select the required materials • Mark the job as per drawing.	• Functions and use of Measuring Tools and Squaring Tools • Function and use of Marking Tools	
LU2. Make Joints by machine	***Trainee will be able to:*** • Identify the marking/measuring tools • Perform Marking on job for joint making • Select the machine/hand tools for joint making • Install attachments (Cutters/Jigs/Fixtures) with machine • Adjust the machine as per operation. • Perform cutting as per requirement. • Assemble the Joint	• Functions and use of Fixing & Holding Tools, Boring Bits, Hand Saws, Hand Planes, Chisels & Gouges, Hammers, Mallets, Screwdrivers, and Sharpening stones	
LU3. Perform Drilling/Boring	***Trainee will be able to:*** • Mark Centre point on the job for drilling/boring • Select the machine/hand tools • Install the required drill Bit. • Set machine as per operation. • Perform drilling/boring	• Functions and use of Drill Press, Boring Machine • Operational techniques of Drill Press and Boring Machine	

LU4. Perform Profiling/ shaping	***Trainee will be able to:*** • Mark the job for profile/shape • Install the required attachments (Cutters/Jigs/Fixtures) • Adjust machine as per operation. • Carry out test cut. • Perform profiling/shaping	• Adjustment techniques profiling machine. • Operational techniques of profiling machine.	
LU5. Perform Turning on Wood Lathe	***Trainee will be able to:*** • Select tools & equipment • Mark the job as per drawing. • Adjust the turning speed/ Feed. • Mount the piece in Lathe chuck. • Adjust the tool rest as per operation. • Perform lathe work as per drawing.	• Function and use of Wood turning Lathe. • Operational techniques of wood lathe.	
LU6. Perform Lipping	***Trainee will be able to:*** • Select the machine/manual tool for lipping • Select the required lipping material. • Adjust the feeding speed of the machine. • Set machine as per operation. • Apply adhesive/lipping material • Perform Lipping. • Test uniformity of lipping	• Function and use of Lipping machine • Adjustment and setting techniques of Lipping machine • Operational techniques of lipping machine.	
LU7. Perform Sanding	***Trainee will be able to:*** • Select the required machine for sanding • Install the required sand paper. • Set machine as per operation. • Perform sanding of job	• Function and use of sanding machine • Adjustment and setting techniques of sanding machine • Operational techniques of sanding machine.	
LU8. Install Hardware (Woodworking)	***Trainee will be able to:*** • Select the required hardware • Mark the job for fitting of hardware	• Knowledge of the following Hardware/ Materials ➢ Nails ➢ Screws	

	• Select the machine/tool • Set machine for hardware installation. • Install the hardware.	➢ Hinges ➢ Locks ➢ Casters ➢ Knock down Fittings ➢ Edging Profiles ➢ Adhesives ➢ Sanding Papers ➢ White Glue	

Example and Illustrations:

7 Essential Marking Tools.

Marking accurately will help increase the quality of your project. Here are some marking tools that are very helpful in the shop.

Pencils and Pens

You need to have a whole bin of pens and pencils at work bench. For marking lines on walnut, you may need a white or yellow colored pencil around. When using drafting templates, you can use mechanical pencil with lead. Sharpie marker is a great thing to keep handy for writing the species of wood on the end of the board and for writing on metal.

Marking Knife

Marking knife does two distinct things: It makes a razor-clean line across the wood that can't be erased, and secondly it severs the wood fibers so that there is a super clean cut. You don't necessarily need a marking knife. A hobby knife, utility knife, or even a pocket knife can do the same job.

(Safety note: You can do some serious damage to your hands with knives, so PAY ATTENTION to what you are doing)

Wheel Marking Gauge

Usually composed of a steel rod, an adjustable fence and a cutting wheel, this marking gauge is an amazing tool for repeating a distance. There are several different models of the marking gauge. The cutting wheel makes a clean line by severing the wood fibers. It can be set to the width of a board or a specific measurement, and is most useful in scribing a line on multiple faces of a board.

Marking Gauge

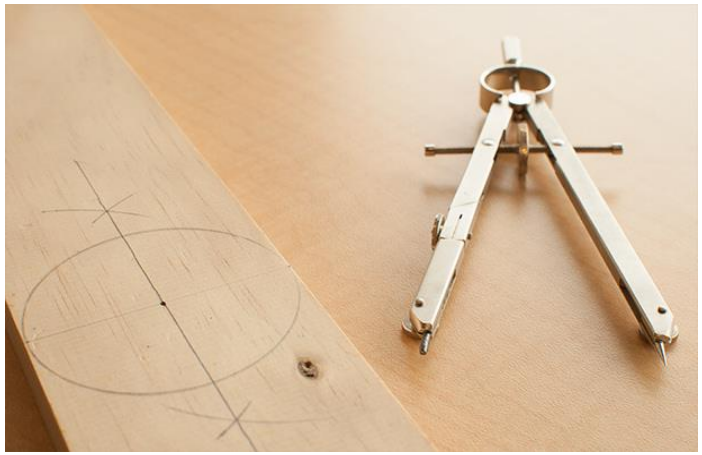
Also known as a cutting gauge or a mortising gauge, this marking gauge is essential for laying out mortise and Tenon joints. It's often made of wood and equipped with 2 points, making it a cinch to make lines that are not only parallel, but the exact width of the chisel you are going to be using.

Scratch Awl

Scratch awl is great for is marking the place where you want to drill. Finding a pencil point while at the drill press (or with drill in hand) can be a bit tough. Marking that point with an awl makes the spot easier to find.

Compass

Just like in high school geometry, the compass can be used for making circles, diving angles and marking distances.



Dividers

The compass's unleaded cousin, when you have a repeating distance to mark (this pair does have a place for a pencil). The metal points let you make a permanent mark where you can come back later and strike a line with your marking knife. This is especially handy when laying out dovetail joints.

Some Final Notes

As with any tools, you get what you pay for. The best advice is "buy the best tool you can afford."

Drill Press

A drill press is an integral woodworking machine that can be used for a number of tasks. Of course, a drill press can be used for drilling, but it can also be fitted with a mortising attachment for drilling square holes, used as a spindle sander, and more

When your woodworking plans call for holes to be drilled in pieces of stock, you could certainly use a hand-operated power drill or cordless drill. However, if precision is a concern or if you have large-diameter holes to drill, you should consider using a drill press. The drill press has a much sturdier motor than a hand-operated drill, and the quill and chuck are kept in alignment with the adjustable-height drill press table ensuring that your holes will be vertically aligned as they are being drilled.

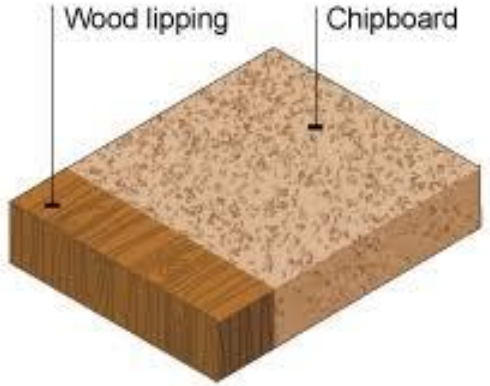
Lipping

Lipping (or edge banding) is used to cover the cut edge of veneered materials such as plywood. Lippings are commonly used on doors, worktops, cabinets and tables.

They are generally glued on, although some lippings are supplied with a pre-applied thermo-setting glue that allows them to be ironed on. Great care must be taken when applying lipping to ensure that it does not delaminate in the event of movement in the substrate.

Materials can be pre-lipped so that the veneer covers the joint between the substrate and the lipping, or they can be post-lipped, with the lipping applied after the veneer.

Lippings can match the veneer or they can contrast with it and may be made from timber, metal, acrylic, melamine and so on.



Profiling:

https://www.weinig.com/en/solid-wood/processing-procedures/planing-and-profiling.html

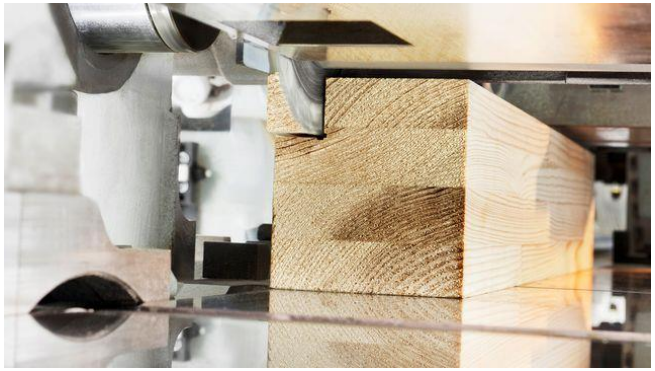
Straightening of the bottom side and of the right side, planning to width and thickness as well as profiling - a machine that can do it all and in a single operation. This makes profiling machines massively superior to all conventional individual machines.

Perfectly right-angled work pieces

Wood is a natural material and that influences the requirements that are involved for processing it. Wood can contain defects; it can be bent or warped. For many applications, therefore, e.g. for furniture, it is essential that the work pieces are planned on all four sides. The key thing here is that the work pieces are accurately straightened and that they have perfect angles after being processed. This may sound easy, but in many cases it is not, because the production precision of the machine has a significant influence on the quality of the end product.

Profiling includes a wide range of end products that nevertheless set the same challenges for machine technology: high levels of profile precision with excellent surface quality and regular cutter marks.

Profiling window scantlings on the long side and the cross side of the window scantling, and shaping and drilling are carried out on the processing center that outputs the fully processed scantling. Profiling window scantlings on the long side and the cross side of the window scantling, and shaping and drilling are carried out on the processing center of the profiling machine that outputs the fully processed scantling.



Creative surfaces are in fashion, whether for furniture frontages, flooring or facades. Previously, things that you could only produce at high cost by hand or in processing centers can now by produced by the profiling machine in one run.

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Hardware Installation:

https://www.woodworkersjournal.com/perfect-hardware-installation/

Just like in every other aspect of woodworking, there are tried-and-true methods for making hardware installation an easier, cleaner and more precise process, as well as reducing the chance of running into problems. installing some of the most common types of cabinet and furniture hardware, including pulls and knobs, hinges and drawer slides are discussed.

Choosing Hardware

When choosing hardware, it's good to compare hardware fiishes against finished wood samples.

Hardware that's prominently located (knobs, latches, etc.) should be chosen to match the scale of the parts it's used with. For example, tiny pulls on big doors may seem out of place or simply appear incorrect.

Hardware finish also affects final appearance considerably and should be chosen not only to suit the style of your piece, but to work harmoniously with the color and grain of the wood your project is built from.

Screw-on Hardware

Double-stick tape holds hardware in place while you frill pilot holes with a self-centering bit.

When you're ready to drive the mounting screws, it's important to choose a screwdriver that fits the screw's drive recess (Phillips, square, etc.) correctly. If you don't, you're in danger of the driver deforming the screw heads in some way and leaving an ugly result.

Nail-on Hardware

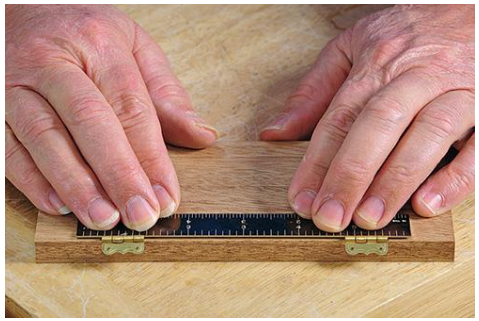
To make the pins easier to drive, rub a little wax on them and use a tack hammer or other small hammer. To avoid smashing your fingers, hold the pin between the teeth of a regular hair comb and leave the comb in place until the fastener is almost fully driven.

Mounting Hinges:

Hinges are needed for any project that has a door, lid, hatch or other articulated parts. Proper installation varies considerably: some hinges are designed to be surface-mounted; others must be mortised into place, while still others require special drilled or routed recesses.

A rule or straightedge pressed against the barrels of surface-mounted hinges will quickly assure correct alignment. The barrels should also be parallel to the edge of the work piece.

Euro-style concealed hinges, popularly used with frameless cabinets, require a large pocket hole (usually 35 mm) for mounting one half of the hinge. Sometimes, you will need to make an adjustment to your depth of cut for a hinge mortise — such as when one leaf from each hinge is surface-mounted, instead of being mortised.



Knobs and Pulls

Unless your cabinet or furniture piece is fitted with push-to-open hardware or has doors and drawers with routed finger grips, you'll need to install some sort of knobs or pulls.

Mortised Hinges

If you are using metal drawer slides in your cabinet or furniture project, your choices are almost as overwhelming as those for hinges and pulls. Basically, you need to choose a set of slides with adequate length and weight capacity as well as enough extension to allow easy access to items in your drawers. These days, some slides are available in different finishes, including black, white and brown.

In order to end up with drawers that operate smoothly with faces that are evenly aligned to the cabinet and to one another, each pair of drawer slides must be mounted at precisely the same height and parallel to one another. Further, the cabinet-mounted portion of each slide must be square (vertically) to the front of the cabinet/drawer housing. You can certainly achieve this by careful measurement, but it's easier to use a universal slide mounting jig. The jig aligns and supports the cabinet-mounted portion of the slide while you screw it in place.

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Module-13

Module 13: Assemble the Job

Objective: This module covers the skills and knowledge required to Perform Pre-assembly of job, clamp the job, Test accuracy of the assembled job, Perform final Assembling of job and Test Firmness of Joints.

Duration: 50 Hours **Theory: 10 Hours** **Practice: 40 Hours**

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
LU1. Perform Pre-assembly of job	***Trainee will be able to:*** • Select the parts for pre assembling • Arrange the parts in Sequence. • Pre-assemble the job to ensure accuracy.	• Assembling Procedures • Alignment/adjustment for Assembling	
LU2. clamp the job	***Trainee will be able to:*** • Identify the clamp as per job demand • Fix/Hold the job with clamp	• Knowledge of different Types of clamps (F-clamp, C-clamp, Bar clamp, Quick Action Clamp, Mitre Clamps and Improvised Clamps	
LU3. Test accuracy of the assembled job	***Trainee will be able to:*** • Check job for accuracy of the required angle • Re-adjust the clamps if required. • Ensure flatness of the job	• Understanding of Carcass Press • Setting of Carcass Press	
LU4. Perform final Assembling of job	***Trainee will be able to:*** • Dismantle the pre-assembled job. • Apply adhesive to the joints. • Assemble the job. • Clamp the Job for firm fixing. • Remove the additional adhesive.	• Clamping techniques of job •	•

LU5. Test Firmness of Joints	***Trainee will be able to:*** • Identify the required fastener • Mount fastener to enhance firmness. • Remove the clamps after adhesive setting.	• Types of reinforcing fasteners	•

Example and Illustrations:

Popular Types of Clamps for Woodworking

Each clamp for woodworking has a specific purpose, since no single clamp is able to perform all types of functions. There are different types of clamps used for woodworking, each with its ideal use. Note that any woodworker is going to need at least a few clamps to avoid having materials slip while working, though you may only need one miter clamp and multiple C-clamps.

1. C-Clamps

A C-clamp is made up of a large, single curved body shaped like a C, hence the name. The screw passes through one end of the C and ends at the upper tip of the “C”. There are variations like the three way edging clamp with three adjustable clamping screw instead of a single one, which is used to hold edge pieces in place during gluing. These types of clamps are used for basic tasks like holding wood together or, on occasion, holding your instructions to the workbench.

The clamping capacity is proportional to the size of the clamp. Most woodworkers need several of these clamps, since they’ll hold 2x4s in place or keep the wood you’re gluing and nailing together until the job is done. Grip holders are specially designed C-clamps that can act as standard C-clamps or firmly hold 10-inch tools like a vise.

2. F-Clamps (aka Bar Clamps)

The f-clamp is designed for a wide opening capacity. The f-clamp has a slider bar that allows the opening capacity to be easily adjusted to satisfy a wide range of applications. This has made the f-clamp another very popular clamp and is used when a C-Clamp's opening capacity is too small. F-Clamp is ideal for Woodworking.

3. Deep Throat Bar Clamp

Deep throat bar clamps combine the power and stretch of pipe clamps with the deep reach of a C-clamp. Their standard depths are 2 to 4 inches, while clamping capacities range from 6 inches to 80 inches. Realistically, most have 1 to 3 foot clamping capacities. Deep throat bar clamps can be replaced by pipe clamps for most applications.

A good trait to look for in deep throat bar clamps is a zinc finished drawn rail that won't leave marks on the wood. The best deep throat bar clamps won't slip while holding the piece in place.

4. Hand screw Clamp

Do it yourselfers usually don't need a hand screw clamp, but they are indispensable to the professional. The hand screw clamp has been a traditional tool in wood working for years. They have solid jaws made from wood or metal and dual threaded rod handles to let you apply significant pressure. In this regard, they are similar to C-clamps. The jaws of a hand screw clamp can be adjusted to clamp sloping, offset and tapered items, which no other clamp can do.

The jaw length and clamping capacity are closely related in hand screw clamps. A hand screw clamp with a 4-inch jaw length provides 2-inch clamping capacity. A 2-foot jaw length comes with a roughly 18-inch clamping capacity. Many hand screw clamps are capable of handling both delicate jobs and tasks where high pressure is required.

5. One-Handed Bar / Quick action Clamps

In most clamps require one hand to position the clamp while the other hand tightens it. One handed clamps eliminate this need by having a fixed jaw and a sliding jaw that is controlled by a trigger grip handle. When you squeeze the trigger, the sliding jaw moves along the bar connecting the two clamp ends toward the fixed jaw. If you press the release lever, the pressure unlocks the sliding jaw. Some models let you remove the jaws, reverse them, then use it as a spreader.

One handed does not mean weak. There are one-handed bar clamps that can sustain several hundred pounds of pressure. You pay more money for the more powerful clamps.

One handed bar clamps are available between 6-inch and 4 feet in length, but most models range from 1 to 3 feet in length. For greater distances, you're better off using a pipe clamp, while distances of less than 12-inch can be handled by C-clamps.

One handed bar clamps are the best bar clamps for people working on multiple or complex projects simultaneously. Quick release C-clamps that act similarly are not considered one handed bar clamps but a type of C-clamp.

6. Spring Clamps

Spring clamps are often called pinch clamps, since they look like and function like over-sized clothes pins. The spring clamp's two sides are connected by a steel spring, separated by squeezing on the handle. Spring clamps are useful for making small repairs. Some models have rubber pads on the jaws to prevent damage to whatever it holds together. You'll pay more for the ergonomic designs, while the simpler designs cost a little more than the clothes pin they resemble.

Spring clamps are not the best wood clamps to use when you're dealing with soft woods like balsa, since they may deform soft wood. A few have padded handles to reduce the strain on the user's hands.

Spring clamps can act as a third hand while making repairs, painting or gluing items. They apply similar force or more than an equally large C-clamp without sticking out as much.

7. Ratchet-Action Bar Clamps

Ratchet action bar clamps, also called band clamps, are the best woodworking clamps for clamping together oddly shaped items. Ratchet action bar clamps use a long, flexible strap – also called a band – to secure the work piece. The band is fitted using a ratcheting mechanism. It then remains in that position until you release the band. This is in contrast to non-ratcheting clamps that take as much time and effort to release as they did to install.

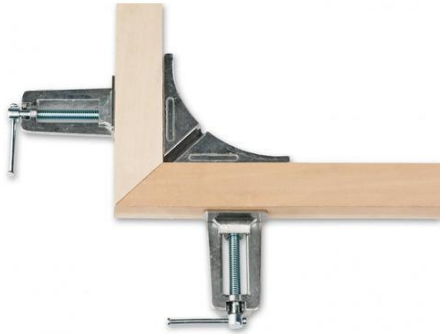
Bands range from 1-inch wide to much wider, but few people need something more than 2-inches wide. Fifteen-foot-long bands are adequate for most people. The price goes up along with the band length.

One benefit of these for smaller applications is that they won't mar wood and soft materials as long as they aren't too tight.

8. Miter Clamps

Miter clamps are used to hold two pieces at a precise right angle. The miter clamp is made so that you simply have to slide in each element and tighten the screw thread handles to hold them in place. Most wood workers only need one miter clamp, if at all, for tasks like assembling picture frames and moldings. They can be used to assemble right-angle butt joints or T-shaped joints. Miter clamps are often sold along with miter spring pliers to hold the item together after you remove the clamp itself.

9. Miter Clamps (aka Corner Clamp)

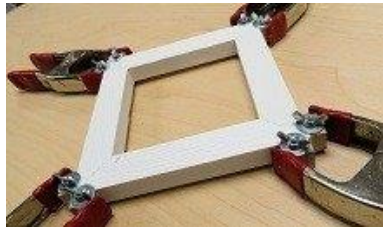


The miter clamp is ideal for connecting corners together for assemblies.

This is Ideal for Woodworking Assemblies

10. Picture Frame Clamps

The picture frame clamp is ideal for clamping together rectangular assemblies such as picture frames, table supports, window frames and Ideal for Woodworking Assemblies.

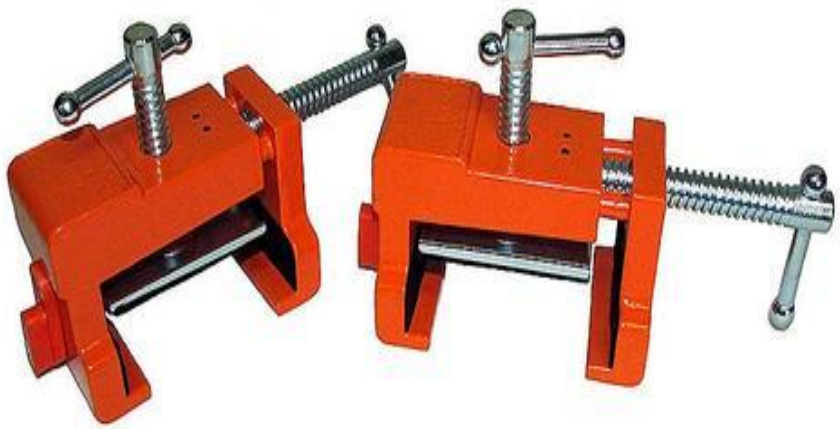


11. Edge Clamps

With three separate screws, the edge clamp can control its position in two axes. This makes the clamp ideal for holding down parts for a butt-weld or for gluing an assembly.

12. Cabinetry Clamps

The cabinetry clamp aligns two adjacent cabinets so that the face frames are flush, allowing you to screw them together. They achieve this by applying clamp load in two axes.



Frequently Asked Questions

1. What is Competency Based Training (CBT) and how is it different from currently offered trainings in institutes?	Competency-based training (CBT) is an approach to vocational education and training that places emphasis on what a person can do in the workplace as a result of completing a program of training. Compared to conventional programs, the competency based training is not primarily content based; it rather focuses on the competence requirement of the envisaged job role. The whole qualification refers to certain industry standard criterion and is modularized in nature rather than being course oriented.
2. What is the passing criterion for CBT certificate?	You shall be required to be declared “Competent” in the summative assessment to attain the certificate.
3. What are the entry requirements for this course?	The entry requirement for this course is 8th Grade or equivalent.
4. How can I progress in my educational career after attaining this certificate?	You shall be eligible to take admission in the National Vocational Certificate Level-4 in Cabinet Maker. You shall be able to progress further to National Vocational Certificate Level-4 in Cabinet Maker Course; and take admission in a level-5, DAE or

	equivalent course (if applicable). In certain case, you may be required to attain an equivalence certificate from The Inter Board Committee of Chairmen (IBCC).
5. If I have the experience and skills mentioned in the competency standards, do I still need to attend the course to attain this certificate?	You can opt to take part in the Recognition of Prior Learning (RPL) program by contacting the relevant training institute and getting assessed by providing the required evidences.
6. What is the entry requirement for Recognition of Prior Learning program (RPL)?	There is no general entry requirement. The institute shall assess you, identify your competence gaps and offer you courses to cover the gaps; after which you can take up the final assessment.
7. Is there any age restriction for entry in this course or Recognition of Prior Learning program (RPL)?	There are no age restrictions to enter this course or take up the Recognition of Prior Learning program
8. What is the duration of this course?	The duration of the course work is 1,510 hrs. (11 months)
9. What are the class timings?	The classes are normally offered 25 days a month from 08:00am to 01:30pm. These may vary according to the practices of certain institutes.
10. What is equivalence of this certificate with other qualifications?	As per the national vocational qualifications framework, the level-4 certificate is equivalent to Matriculation. The equivalence certificate can be obtained from The Inter Board Committee of Chairmen (IBCC).
11. What is the importance of this certificate in National and International job market?	This certificate is based on the nationally standardized and notified competency standards by National Vocational and Technical Training Commission (NAVTTC). These standards are also recognized worldwide as all the standards are coded using international methodology and are accessible to the employers worldwide through NAVTTC website.
12. Which jobs can I get after attaining this certificate? Are there job for this certificate in public sector as well?	You shall be able to take up jobs in the local or overseas construction companies in heavy machinery operator job profile.
13. What are possible career progressions in industry after attaining this certificate?	You shall be able to progress up to the level of supervisor after attaining sufficient experience, knowledge and skills during the job. Attaining additional relevant qualifications may aid your career advancement to even higher levels.

14. Is this certificate recognized by any competent authority in Pakistan?	This certificate is based on the nationally standardized and notified competency standards by National Vocational and Technical Training Commission (NAVTTC). The official certificates shall be awarded by the relevant certificate awarding body.
15. Is on-the-job training mandatory for this certificate? If yes, what is the duration of on-the-job training?	On-the-job training is not a requirement for final / summative assessment of this certificate. However, taking up on-the-job training after or during the course work may add your chances to get a job afterwards.
16. How much salary can I get on job after attaining this certificate?	The minimum wages announced by the Government of Pakistan in 2019 are PKR 17,500. This may vary in subsequent years and different regions of the country. Progressive employers may pay more than the mentioned amount. The heavy Machinery Operator normally earns 20,000 to 25,000 in the start.
17. Are there any alternative certificates which I can take up?	There are some short courses offered by some training institutes on this subject. Some institutes may still be offering conventional certificate courses in the field.
18. What is the teaching language of this course?	The leaching language of this course is Urdu and English.
19. Is it possible to switch to other certificate programs during the course?	There are some short courses offered by some training institutes on this subject. Some institutes may still be offering conventional certificate courses in the field.
20. What is the examination / assessment system in this program?	Competency based assessments are organized by training institutes during the course which serve the purpose of assessing the progress and preparedness of each student. Final / summative assessments are organized by the relevant qualification awarding bodies at the end of the certificate program. You shall be required to be declared “Competent” in the summative assessment to attain the certificate.
21. Does this certificate enable me to work as freelancer?	You can start your small business by purchasing your own heavy construction machine and can start earning 50,000 per month. You may need additional skills on entrepreneurship to support your initiative.

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