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FURNITURE TECHNICIAN



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LEARNER GUIDE

National Vocational Certificate Level 2

Version 1 - June, 2019



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Introduction

Welcome to your Learner's Guide for the Furniture Technician Programme. It will help you to complete the programme and to go on to complete further study or go straight into employment.

The Furniture Technician programme is to engage young people with a programme of development that will provide them with the knowledge, skills and understanding to start this career in Pakistan. The programme 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-2
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Module 02: 072200891 Prepare Wooden Components of the Furniture

Objective of the module: The aims of this module to be develop knowledge, skills and understanding of preparing wooden components of the furniture.

Duration 60 hours **Theory:** 12 hours **Practical:** 48 hours

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
LU1: Cut wood logs into planks	The student will be able to: <ul style="list-style-type: none"> • Ensure alignment of log on machine trolley • Cut planks from log as per size requirements • Mark and record the sizes of planks Stack the planks as per seasoning requirement	Introduction to the conversion, methods of conversion and requirement. Elaborate the basic machine for log sawing including introduction, parts, blades and operations of the machine <ul style="list-style-type: none"> ➤ Log Band Saw ➤ Wood Miser ➤ Blade sharpening machine ➤ Blade setting machine ➤ Butt Welding machine ➤ Grinding machine Introduction to the stacking method, seasoning, kinds of seasoning and its application requirements Executing the practical work after adjusting all parameter.	Wooden Logs Log band saw or wood miser Log sawing blades Log band saw Blade sharpening machines Saw setting machine Butt welding machine Grinding machine Blade cutter
LU2: Prepare templates for furniture components	The student will be able to: <ul style="list-style-type: none"> • Paste the drawing on the template material (Ply Wood, Medium Density Fibre Board, Solid Wood etc.) • Cut the template as per 	Introduction to the various tracing tools and techniques to apply the drawing or templates. Elaborate the basic machine for cutting & shaping including introduction, parts, blades and operations of the machine <ul style="list-style-type: none"> ➤ Scroll Saw ➤ Jig Saw 	Drawing sheet Paper cutter Template material (Plywood or M.D.F. or Wood) Tracing Pencil Spindle Molder Plunge router

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
	<p>drawing</p> <p>Finish the edges of template to achieve accurate profile</p>	<ul style="list-style-type: none"> ➤ Spindle Molder ➤ Plunge Router <p>Detailed knowledge about various board material (plywood, medium density fibre board)</p> <p>Elaborating the cutting/shaping for making templates using hand tools</p> <p>Knowledge about jigs/fixtures used for cutting and shaping</p> <p>Executing the practical work after adjusting all parameter.</p>	<p>Jig saw</p> <p>Scroll Saw</p> <p>Copying Saw</p> <p>Fret Saw</p> <p>Half round file</p> <p>Half round rasps</p>
<p>LU3:</p> <p>Cut wood planks into furniture components</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> • Trace various components on the plank using drawings/template considering wood grains while maintaining cutting efficiency/average <p>Cut furniture components from planks as per tracing or using jigs/fixtures/fences</p>	<p>Introduction to the working with straight pieces and working with curved pieces including the working efficiency</p> <p>Elaborate the basic machine for cutting including introduction, parts, blades and operations of the machine</p> <ul style="list-style-type: none"> ➤ Band Saw ➤ Multiple Rip Saw ➤ Cross cut Saw ➤ Table Saw <p>Knowledge about jigs/fixtures used for cutting straight or in curves</p> <p>Executing the practical work after adjusting all parameter.</p>	<p>Band Saw</p> <p>Wooden planks</p> <p>Scroll Saw</p> <p>Compass saw</p> <p>Multiple rip saw</p> <p>Cross cut saw</p> <p>Table saw</p>
<p>LU4:</p> <p>Cut board/panels into furniture</p>	<p>The trainee will be able to:</p> <ul style="list-style-type: none"> • Trace various components on the board / panel using drawings/template while 	<p>Introduction to the working with straight pieces and working with curved/angled pieces including the working efficiency</p> <p>Elaborate the basic machine for cutting</p>	<p>Board sheets</p> <p>Table saw</p> <p>Panel saw or Beam Saw</p> <p>Edge Banding Machine</p>

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
components	<p>maintaining cutting efficiency/average for curved work/job</p> <p>Cut furniture components from board / panel as per size using fences</p>	<p>including introduction, parts, blades and operations of the machine</p> <ul style="list-style-type: none"> ➤ Table Saw ➤ Panel Saw ➤ Beam Saw ➤ Edge Banding machine <p>Knowledge about jigs/fixtures used for cutting straight or in curves</p> <p>Executing the practical work after adjusting all parameter.</p>	Jigs & Fixtures
<p>LU5.</p> <p>Plane surfaces of wooden components</p>	<p>The trainee will be able to:</p> <ul style="list-style-type: none"> • Plane the surface of work piece to maintain surface evenness / smoothness <p>Plane edges of work piece to maintain right angle</p>	<p>Introduction to the planning the surface, no. of surfaces, importance and requirement.</p> <p>Elaborate the basic machine for planning including introduction, parts, blades and operations of the machine</p> <ul style="list-style-type: none"> ➤ Jointer ➤ 4-Side Planner/Moulder <p>Executing the practical work after adjusting all parameter.</p>	<p>Wooden components</p> <p>Jointer</p> <p>Portable planner</p> <p>4-Side Planner</p>
<p>LU6.</p> <p>Finalize the size of wooden components</p>	<p>The trainee will be able to:</p> <p>Plane the work piece to achieve required thickness</p> <ul style="list-style-type: none"> • Plane the work piece to achieve required width <p>Cut the work piece to achieve final size as per drawing</p>	<p>Introduction to the planning the surface in specific sizing, importance and requirement.</p> <p>Elaborate the basic machine for planning in thickness including introduction, parts, blades and operations of thickness planner.</p> <p>Executing the practical work after adjusting all parameter.</p>	Thickness planner

Examples and illustrations



Sawmill School - Making Your First Cut on Your Sawmill

<https://www.youtube.com/watch?v=nMkg5M37ON0>



Amazing Biggest Woodworking Heavy Sawmill Cutting Wood - Excellent Sawmill Extreme Techniques

<https://www.youtube.com/watch?v=1yQkBWhweF0>

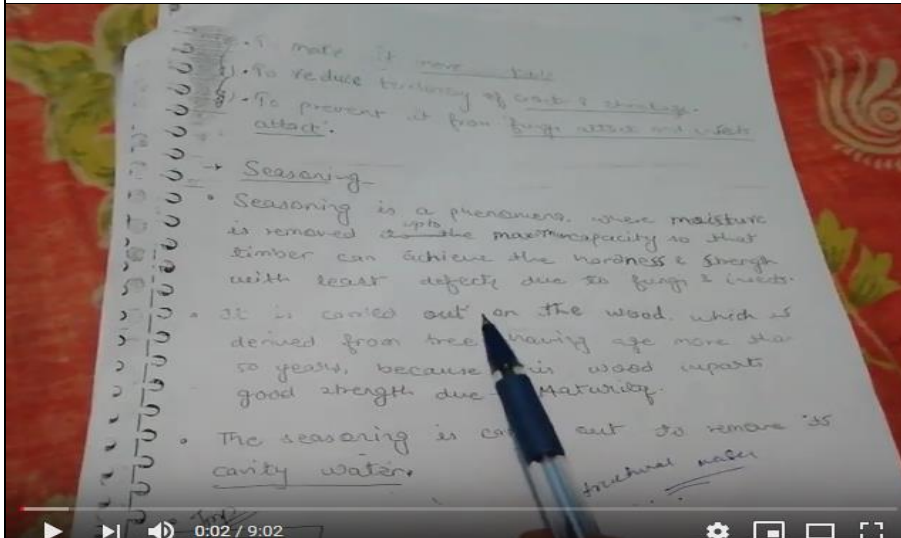
Seasoning of Timber -2

Types of seasoning



Seasoning of timber types of seasoning

<https://www.youtube.com/watch?v=veD-xtLdDpU>



Seasoning of timber & its types

<https://www.youtube.com/watch?v=y8NOJqmKML4>



How to Use a Table Saw | Woodworking

<https://www.youtube.com/watch?v=F8kUMwluwMk>

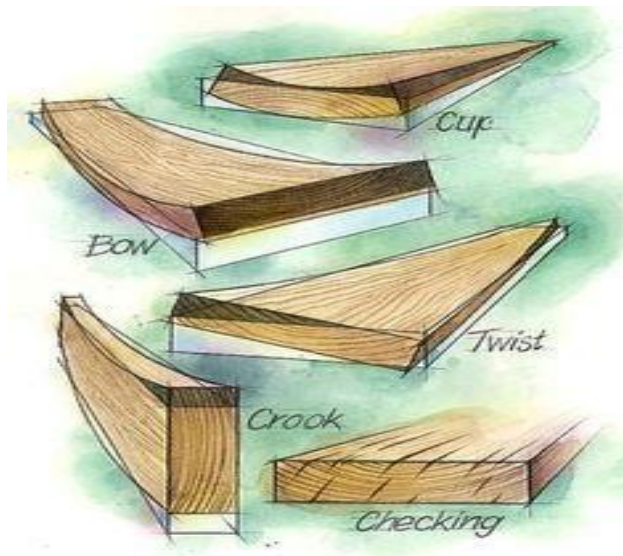
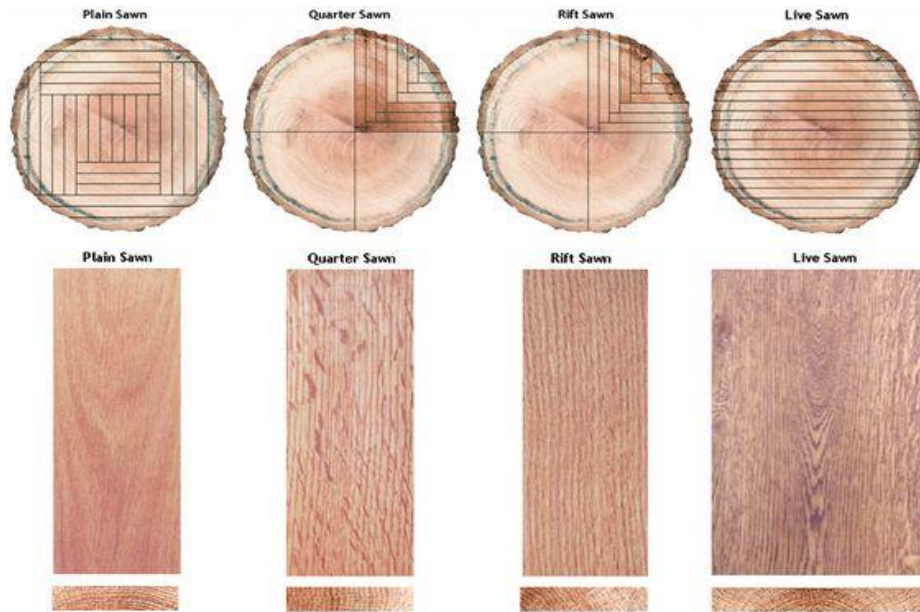


HOMAG 3 Series Panel Saws | Stiles Machinery

https://www.youtube.com/watch?v=y2KzEB1b_eM



Felder AD 751 PRO 20" Jointer / Planer Combo Machine
https://www.youtube.com/watch?v=5L7IzBL_JgM



7 Things You MUST Know About Wood Before You Build

Before You Build

PLAIN SAWN RIFT SAWN QUARTER SAWN

Thrift Diving

This tree is 62 years old. It's been through fire and drought, plague and plenty. And all of this is recorded in its rings.

1880
1885
1890
1895
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000

Each spring and summer a tree adds new layers of wood to its trunk. The wood from its spring grows fast, and is lighter because it consists of large cells. In summer, growth is slower, the wood has smaller cells and is darker. So when the tree is cut, the layers appear as alternating rings of light and dark wood.

Count the dark rings, and you know the tree's age. Study the rings, and you can learn much more. Many things affect the way a tree grows, and thus alter the shape, thickness, color and uniformity of the rings.

Champion
American Forest Foundation

SLAB CUT
The rounded sides are not usable as timber, and are usually sent to the chipper

CLEAR CUT
Has the fewest knots, usually made into boards or planks

CENTRE CUT
Heavier planks and beams are sourced from here, but knots increase toward the center of the log

RIFT SAWN
Timber that has the growth rings between 60 to 45 degrees to the surface of the board

QUARTER SAWN
Timber that has the growth rings between 60 to 90 degrees to the surface of the board

FLAT SAWN
Timber that has the growth rings between 45 degrees to parallel with surface of the board

Source: www.pinterest.com

Module summary

Course: <Furniture Technician>	Total Course Duration: 1200 Hrs
Course Overview:	
<p>The purpose of these qualifications is to set high professional standards for furniture industry.</p> <ul style="list-style-type: none"> • Improve the professional competence of the trainees • Shift from informal and non-formal to formal technical and vocational training • Provide opportunities for recognition of skills attained through non-formal or informal pathways • Improve the quality and effectiveness of training and assessment for furniture sector • Enable the existing workforce to capacitate themselves in new technologies and methods 	

Module	Learning Unit	Duration
<p>Module 1: Develop drawings of furniture products manually</p> <p>Aim: The aim of this module to be develop knowledge, skills and understanding to develop drawings of furniture products manually.</p>	<p>LU1: Develop component and size chart</p> <p>LU2: Prepare 2D Multiview drawing of Furniture</p> <p>LU3: Prepare 2D Multiview drawing of Furniture Components</p> <p>LU4:</p>	140 hours
<p>Module 2: Prepare wooden components of the furniture</p> <p>Aim: The aim of this module to be develop knowledge, skills and understanding of preparing wooden components of the furniture.</p>	<p>LU1: Cut wood logs into Planks</p> <p>LU2: Prepare templates for furniture components</p> <p>LU3: Cut wood planks into furniture components</p> <p>LU4: Cut board/ panels into furniture components</p> <p>LU5: Plain surfaces of wooden components</p> <p>LU6: Finalize the size of wooden components</p>	60 hours

Module	Learning Unit	Duration
Module 3: Make Furniture Joints Aim: The aim of this module to be develop knowledge, skills and understanding of making different types of joints being used for furniture manufacturing.	LU1: Perform Cutting LU2: Perform Planing LU3: Prepare joints as per design / drawing LU4: Assemble joints	200 hours
Module 4: Apply surface aesthetics Aim: The aim of this module to be develop advanced knowledge, skills and understanding to apply surface aesthetics on the furniture.	LU1: Perform profiling of components LU2: Perform turning of components LU3: Perform Carving Manually LU4: Perform Marquetry/Parquetry Manually	100 hours
Module 5: Assemble Furniture Products Aim: The aim of this module to be develop basic knowledge, skills and understanding required to assemble the furniture products.	LU1: Pre-Assemble Furniture Products parts LU2: Assemble Furniture Products parts LU3: LU4:	20 hours
Module 6: Perform Finishing Operations on Furniture Aim: The aim of this module to be develop advanced knowledge, skills and understanding required to perform finishing operations on furniture.	LU1: Prepare the surfaces LU2: Perform staining on surfaces LU3: Perform sealing LU4: Perform top finishing LU5: Apply powder coating on metal furniture	120 hours

Module	Learning Unit	Duration
<p>Module 7: Perform Upholstery</p> <p>Aim: The aim of this module to develop advanced knowledge, skills and essential understanding of materials, techniques needed to perform upholstery on furniture.</p>	<p>LU1: Apply Tapestry on the furniture</p> <p>LU2: Apply Canning on the furniture</p> <p>LU3:</p> <p>LU4:</p>	100 hours
<p>Module 8: Prepare Metal Furniture Products</p> <p>Aim: The aim of this module to be develop advanced knowledge, skills and essential understanding required to prepare metal furniture products</p>	<p>LU1: Cut required components from raw material</p> <p>LU2: Prepare furniture components as per design</p> <p>LU3: Assemble the furniture components using welding</p> <p>LU4: Assemble the furniture components using Knockdown method</p>	110 hours
<p>Module 9: Handle Logistics</p> <p>Aim: The aim of this module to develop basic knowledge, skills and understanding needed to handle the logistics at warehouse</p>	<p>LU1: Pack the furniture</p> <p>LU2: Load the furniture for delivery and transportation</p> <p>LU3:</p> <p>LU4:</p>	20 hours
<p>Module 10: Develop drawings of furniture products using CAD/CAM</p> <p>Aim: The aim of this module is to develop advanced knowledge, skills and understanding needed develop drawings of furniture products using CAD/CAM.</p>	<p>LU1: Draw 2D Multiview drawing of Furniture Components on CAD</p> <p>LU2: Develop 3D model of Furniture Components</p> <p>LU3: Convert CAD drawing into CAM Code</p>	140 hours

Module	Learning Unit	Duration
<p>Module 11: Apply surface aesthetics using CNC Machines</p> <p>Aim: The aim of this module to develop advanced knowledge, skills and understanding needed to apply surface aesthetics using CNC machines</p>	<p>LU1: Perform Turning of components on CNC Turning Centre</p> <p>LU2: Perform Carving on CNC Machining Centre</p> <p>LU3: Perform Marquetry/Parquetry on CNC Laser Machine</p>	<p>190 hours</p>

Frequently Asked Questions

<p>1. What is Competency Based Training (CBT) and how is it different from currently offered trainings in institutes?</p>	<p>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.</p>
<p>2. What is the passing criterion for CBT certificate?</p>	<p>You shall be required to be declared “Competent” in the summative assessment to attain the certificate.</p>
<p>3. What are the entry requirements for this course?</p>	<p>The entry requirement for this course is 8th Grade or equivalent.</p>
<p>4. How can I progress in my educational career after attaining this certificate?</p>	<p>You shall be eligible to take admission in the National Vocational Certificate Level-3 in Furniture Technician (Finisher, Upholster, Metal Fabricator). You shall be able to progress further to National Vocational Certificate Level-4 in Furniture Technician (Furniture Designer); and take admission in a level-5, DAE or equivalent course. In certain case, you may be required to attain an equivalence certificate from The Inter Board Committee of Chairmen (IBCC).</p>

<p>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?</p>	<p>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.</p>
<p>6. What is the entry requirement for Recognition of Prior Learning program (RPL)?</p>	<p>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.</p>
<p>7. Is there any age restriction for entry in this course or Recognition of Prior Learning program (RPL)?</p>	<p>There are no age restrictions to enter this course or take up the Recognition of Prior Learning program</p>
<p>8. What is the duration of this course?</p>	<p>The duration of the course work is 1,510 hrs. (approx. 11 months)</p>
<p>9. What are the class timings?</p>	<p>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.</p>
<p>10. What is equivalence of this certificate with other qualifications?</p>	<p>As per the national vocational qualifications framework, the level-4 certificate is equivalent to Matriculation. The criteria for equivalence and equivalence certificate can be obtained from The Inter Board Committee of Chairmen (IBCC).</p>
<p>11. What is the importance</p>	<p>This certificate is based on the nationally</p>

of this certificate in National and International job market?	standardized and notified competency standards by National Vocational and Technical Training Commission (NAVTTTC). These standards are also recognized worldwide as all the standards are coded using international methodology and are accessible to the employers worldwide through NAVTTTC 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 Furniture making companies in the functions of cutting, assembly and finishing of furniture articles.
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 (NAVTTTC). 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	The minimum wages announced by the Government of Pakistan in 2019 are PKR 17,500.

attaining this certificate?	This may vary in subsequent years and different regions of the country. Progressive employers may pay more than the mentioned amount.
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 teaching 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 of stitching Furniture making, upholstery or finishing or other products. You may need additional skills on entrepreneurship to support your initiative.

Short Question & Answers

What is meant by Conversion?	Converting logs into planks is known as conversion. Conversion is first step before seasoning. Whole logs cannot be handled.
Narrate the kinds of conversion	<ol style="list-style-type: none"> 1. Slab sawing 2. Quarter sawing
What is seasoning, why it is important?	Drying of wood is called seasoning. Wood is hygroscopic in nature due to which it of high importance that wood should be properly dried before work on to avoid warping at the later stage. Without seasoning it is quite hard to control the wood warping.
Is it possible to use wood without seasoning?	Yes it is possible to use the wood but face difficulties in machining, finishing and finally result in the warping of the wood.
Enlist the important benefits of seasoning	<p>Following are the important benefits achieved as a result of seasoning.</p> <ol style="list-style-type: none"> 1. Reduced weight 2. Easy transport 3. Easy handling 4. Reduced warping 5. Enhanced machining 6. Enhanced workability 7. Enhanced screwing 8. Enhanced nailing 9. Enhanced strength properties

	<p>10. Increased fungal resistance 11. Enhanced insect attack resistance 12. Increased finishing</p>
<p>For what purpose Multiple Rip Saw is used?</p>	<p>As the name indicates it is specifically used for ripping more than one piece in a single pass. It is used for heavy production without any hassle. A chain drive feeds the planks up to the blades while anti kick back fingers helps to eliminate the chances of kick back.</p>

Test Yourself (Multiple Choice Questions)

MODULE 3

- Question 1** The process of making planks from log is called as
- A Transfer
 - B Conversion
 - C Inversion
 - D None of the above
- Question 2** The commercial method used for seasoning of wood is
- A Air Seasoning
 - B Kiln Seasoning
 - C Chemical Seasoning
 - D None of the above

Question 3 The machine used to support ripping in production is

- A Band Saw
- B Table Saw
- C Multiple Rip Saw
- D None of the above

Question 4 Curve cutting/template cutting is performed on

- A Table Saw
- B Band Saw
- C Cross Cut Saw
- D None of the above

Question 5 The most versatile machine according to use is

- A Spindle Moulder
- B Plunge Router
- C Scroll Saw
- D None of the above

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