

Syllabus on Vocational Education and Training Course (VTC)

Paper Title	: Carpentry - I							
CODE	: VTC: 242.4							
Number of Credits	: 4							
Semester	: III							
No. of Theory Hours Per Week	: One (1 hour)							
No. of Practical Hours per Week	: Three (3 Hours)							
Outline of the Paper:								
Type of Course	Units in the VTC	Hours	Credits	Total Marks	Distribution of Marks (as per OC-8)			
Carpentry - I					In-Semester		End-Semester	
					Theory	Practical	Theory	Practical
	Unit-I Theory (25 Marks)	15			25			
	Unit-II to IV Theory (75 Marks)	90	4	100		15		60
Marks Distribution	: Internal Assessment: 40							
	: External Assessment: 60							
Course Objectives	<ol style="list-style-type: none"> 1. Equip with Safety Protocols and Practical Skills: The course aims to provide students with a comprehensive understanding of safety protocols and practical skills necessary for carpentry work. 2. Develop Proficiency in Tool Usage, Joint Construction, and Timber Management: Students will develop proficiency in using woodworking tools, constructing various joints, and managing timber effectively through hands on training and theoretical knowledge. 3. Prepare for Entry Level Carpentry Positions or Further Study: By the end of the course, students will be prepared to pursue entry level carpentry positions or further study in the field, equipped with the necessary skills and knowledge. 							
Course Learning Outcome	<p>At the end of the course students are able to:</p> <ol style="list-style-type: none"> 1. apply to safety measures in a woodworking environment, ensuring their wellbeing and that of others 2. develop proficiency in the usage and maintenance of various woodworking tools, enhancing their efficiency and effectiveness 3. demonstrate the construction of different types of woodworking joints, including framing joints, enhancing their versatility in carpentry projects 4. demonstrate timber seasoning and preservation techniques, enabling them to manage wood effectively to prevent warping and ensure durability 5. develop skills to execute carpentry tasks with precision and efficiency, resulting in high quality craftsmanship and timely project completion 							

	<p>6. Illustrate a professional attitude towards carpentry work, demonstrating professionalism, responsibility, and dedication in their craft.</p>
<p>Unit I: (Theory) 15 Hours</p>	<p>Basic Safety and Woodworking Tools</p> <ul style="list-style-type: none"> • Safety Precautions • Types of Saws and Planes • Hand and Striking Tools • Classification of Joints • Timber Seasoning and Preservation
<p>UNIT-II: (Practical) 30 Hours</p>	<p>Practical Introduction to Hand Tools and Sawing</p> <p>1. Introduction to the Trade:</p> <ul style="list-style-type: none"> • Introduction to the woodworking trade, including its scope and applications. <p>2. Identification of Hand Tools:</p> <ul style="list-style-type: none"> • Identify and familiarize with various hand tools used in woodworking, understanding their specific functions. <p>3. Sawing Practice:</p> <ul style="list-style-type: none"> • Develop skills in sawing, including straight and curved cutting using different saws. <p>4. Planning Practice:</p> <ul style="list-style-type: none"> • Practice planning techniques to achieve smooth and even surfaces on wooden pieces. <p>5. Tool Handling and Maintenance:</p> <ul style="list-style-type: none"> • Learn proper handling and maintenance of hand tools to ensure efficiency and safety during use.
<p>UNIT-III: (Practical) 30 Hours</p>	<p>1. Chiseling Techniques:</p> <ul style="list-style-type: none"> • Gain proficiency in chiseling techniques, including basic and advanced chiseling practices. <p>2. Multiple Chiseling Practices:</p> <ul style="list-style-type: none"> • Perform multiple chiseling exercises to develop precision and control. <p>3. Joint Practice:</p> <ul style="list-style-type: none"> • Demonstrate various joint making techniques, focusing on framing joints. <p>4. Construction of Frames:</p> <ul style="list-style-type: none"> • Construct frames using different types of joints, ensuring accuracy and stability. <p>5. Application of Joint Techniques:</p> <ul style="list-style-type: none"> • Apply joint techniques in practical projects, enhancing overall woodworking skills.
<p>UNIT-IV: (Practical) 30 Hours</p>	<p>Practical Timber Drying and Broadening Joints</p> <p>1. Timber Drying Techniques:</p> <ul style="list-style-type: none"> • Learn and demonstrate techniques for drying timber to prevent warping and cracking. <p>2. Understanding Broadening Joints:</p> <ul style="list-style-type: none"> • Understand the concept and application of broadening

	<p>joints in woodworking projects.</p> <p>3. Practical Application of Broadening Joints:</p> <ul style="list-style-type: none"> • Perform practical exercises on creating broadening joints to expand the width of wooden pieces. <p>4. Integration of Techniques:</p> <ul style="list-style-type: none"> • Integrate drying and broadening techniques into comprehensive woodworking projects. <p>5. Quality Control:</p> <ul style="list-style-type: none"> • Develop skills in quality control to ensure the durability and aesthetic appeal of finished woodworking products
Suggested Readings	<ol style="list-style-type: none"> 1. Andy Engel, “Carpentry Complete: Expert Advice from Start to Finish” 2. Albert Jackson, David Day, and Simon Jennings, “The Complete Manual of Woodworking” Reference Books: 3. Bill Hylton, “Illustrated Cabinetmaking: How to Design and Construct Furniture That Works” 4. Chris Marshall, “The Complete Guide to Carpentry for Homeowners: Basic Carpentry Skills & Everyday Home Repairs”
Requirements	<ul style="list-style-type: none"> • Saws (hand saw, coping saw, crosscut saw, rip saw) • Chisels (bevel edge, mortise, paring) • Hammers (claw, mallet) • Screwdrivers • Planes (block plane, bench plane) • Measuring tools • Marking tools (pencil, marking gauge) • Sandpaper • Clamps (G-clamps, bar clamps) • Safety gear (gloves, goggles, dust masks) • First aid kits • Toolboxes for organization • Workbenches and sawhorses • Storage for wood and materials • Any other item as and when required
Qualified Instructors	<ul style="list-style-type: none"> • Instructors with experience in Carpentry and teaching. • Certifications or relevant qualifications in Carpentry

Paper Title	: Carpentry -II							
CODE	: VTC: 262.4							
Number of Credits	: 4							
Semester	: IV							
No. of Theory Hours Per Week	: One (1 hour)							
No. of Practical Hours per Week	: Three (3 Hours)							
Outline of the Paper:								
Type of Course	Units in the VTC	Hours	Credits	Total Marks	Distribution of Marks (as per OC-8)			
Carpentry-II					In-Semester		End-Semester	
					Theory	Practical	Theory	Practical
	Unit-I Theory (25 Marks)	15	4	100	25			
Unit-II to IV Theory (75 Marks)	90				15		60	
Marks Distribution	: Internal Assessment: 40 : External Assessment: 60							
Course Objectives	<ol style="list-style-type: none"> 1. Mastery of theoretical knowledge and practical skills in carpentry, including the use of boring tools, chisels, drilling machines, planes, and timber types. 2. Proficiency in furniture layout and construction, with the ability to create tables, racks, frames, etc., using nails and screws of appropriate sizes. 3. Competence in wood carving and the application of varnish and polish for finishing furniture objects. 							
Course Learning Outcome	<p>At the end of the course students are able to:</p> <ol style="list-style-type: none"> 1. identify the different types of boring tools used in carpentry and their specific applications in woodworking tasks 2. demonstrate proficiency in using chisels for shaping, carving, and sculpting wood, understanding various chisel types and their uses. 3. develop practical skills in operating drilling machines safely and effectively, including knowledge of different drill bits and drilling techniques 4. use planes for shaping and smoothing wood surfaces, understanding different plane types and their functions. 5. identify different types of timber commonly used in carpentry, understanding their properties and suitability for various projects 6. identify the quality of plywood, including its composition, grades, and applications in carpentry projects 7. develop skills in proper nailing and screwing techniques, including selecting the right fasteners and driving them accurately 8. the process of timber conversion from raw logs to usable lumber, including sawing, milling, and seasoning 							

	<p>techniques</p> <p>9. prepare a bill of materials for carpentry projects, including estimating material quantities and costs.</p> <p>10. differentiate types of sandpaper grits and their uses in sanding wood surfaces to achieve desired finishes.</p> <p>11. use skills in furniture polishing, including surface preparation, application of stains or finishes, and buffing for a professional appearance.</p>
Unit I: (Theory) 15 Hours	<p>Theory of Woodworking Tools, Materials, and Finishing Techniques</p> <ul style="list-style-type: none"> • Boring Tools and Drilling Machines • Timber and Plywood • Properties of Wood and Fasteners • Material Estimation and Bill Preparation • Finishing Techniques
UNIT-II: (Practical) 30 Hours	<p>Application of Boring Tools and Timber Layout</p> <p>1. Handson with Boring Tools:</p> <ul style="list-style-type: none"> • Gain practical experience in using boring tools effectively in woodworking tasks. <p>2. Timber Layout Techniques:</p> <ul style="list-style-type: none"> • Learn to layout timber for different furniture pieces, ensuring accurate measurements and efficient use of materials. <p>3. Timber Selection and Preparation:</p> <ul style="list-style-type: none"> • Develop skills in selecting the appropriate timber for specific furniture projects and preparing it for use. <p>4. Application of Theoretical Knowledge:</p> <ul style="list-style-type: none"> • Apply theoretical knowledge about timber and tools in practical scenarios, enhancing understanding and proficiency. <p>5. Safety Practices:</p> <ul style="list-style-type: none"> • Practice safe handling and usage of tools and timber during woodworking tasks.
UNIT-III: (Practical) 30 Hours	<p>Woodworking: Furniture Making</p> <p>1. Construction of Furniture Pieces:</p> <ul style="list-style-type: none"> • Construct small furniture items such as tables, racks, and frames using appropriate woodworking techniques. <p>2. Usage of Fasteners:</p> <ul style="list-style-type: none"> • Learn to select and use nails and screws of various sizes effectively in different furniture making contexts. <p>3. Assembly Skills:</p> <ul style="list-style-type: none"> • Develop skills in assembling furniture components accurately and securely. <p>4. Project Planning and Execution:</p> <ul style="list-style-type: none"> • Plan and execute small woodworking projects from start to finish, including design, material selection, and construction.

	<p>5. Problem Solving:</p> <ul style="list-style-type: none"> Enhance problem solving skills by addressing and resolving issues encountered during the furniture making process.
<p>UNIT-IV: (Practical) 30 Hours</p>	<p>Finishing and Polishing Techniques</p> <p>1. Wood Carving Techniques:</p> <ul style="list-style-type: none"> Gain hands on experience in wood carving, learning various techniques to create intricate designs. <p>2. Finishing Skills:</p> <ul style="list-style-type: none"> Develop skills in finishing wooden objects, including sanding, varnishing, and polishing to achieve a professional look. <p>3. Application of Finishing Products:</p> <ul style="list-style-type: none"> Learn to apply varnish and polish correctly to enhance the appearance and durability of wooden furniture. <p>4. Understanding Finishing Stages:</p> <ul style="list-style-type: none"> Understand the different stages of finishing and the importance of each stage in achieving a high quality end product. <p>5. Handson Training:</p> <ul style="list-style-type: none"> Obtain hands on training in finishing techniques, ensuring competence in creating smooth and polished wooden surfaces.
<p>Suggested Readings</p>	<ol style="list-style-type: none"> Andy Engel, “Carpentry Complete: Expert Advice from Start to Finish” Albert Jackson, David Day, and Simon Jennings, “The Complete Manual of Woodworking” Reference Books: Bill Hylton, “Illustrated Cabinetmaking: How to Design and Construct Furniture That Works” Chris Marshall, “The Complete Guide to Carpentry for Homeowners: Basic Carpentry Skills & Everyday Home Repairs”
<p>Requirements</p>	<ul style="list-style-type: none"> Saws (hand saw, coping saw, crosscut saw, rip saw) Chisels (bevel edge, mortise, paring) Hammers (claw, mallet) Screwdrivers Planes (block plane, bench plane) Measuring tools Marking tools (pencil, marking gauge) Sandpaper Clamps (G-clamps, bar clamps) Safety gear (gloves, goggles, dust masks) First aid kits Toolboxes for organization Workbenches and sawhorses Storage for wood and materials

	<ul style="list-style-type: none">• Any other item as and when required
Qualified Instructors	<ul style="list-style-type: none">• Instructors with experience in Carpentry and teaching.• Certifications or relevant qualifications in Carpentry

Paper Title	: Carpentry -III							
CODE	: VTC: 362.4							
Number of Credits	: 4							
Semester	:VI							
No. of Theory Hours Per Week	: One (1 hour)							
No. of Practical Hours per Week	: Three (3 Hours)							
Outline of the Paper:								
Type of Course	Units in the VTC	Hours	Credits	Total Marks	Distribution of Marks (as per OC-8)			
Carpentry-III					In-Semester		End-Semester	
					Theory	Practical	Theory	Practical
	Unit-I Theory (25 Marks)	15			25			
	Unit-II to IV Theory (75 Marks)	90	4	100		15		60
Marks Distribution	: Internal Assessment: 40							
	: External Assessment: 60							
Course Objectives	<ol style="list-style-type: none"> 1. Mastery of woodworking machinery operations, including knowledge of machine types, sizes, parts, functions, and safety precautions. 2. Proficiency in pattern and design making, as well as the construction of window frames and shutters. 3. Competence in furniture repair techniques for various objects like doors, windows, and racks. 4. Understanding of fundamental geometrical concepts and units of measurement, including angles, triangles, rectangles, squares, rhombuses, parallelograms, and system conversions. 5. Practical experience in operating woodworking machines such as the drilling machine, grinding machine, mortiser machine, and universal woodworking machine. 6. Application of geometric principles and unit conversions in woodworking exercises. 							
Course Learning Outcome	<p>At the end of the course students are able to:</p> <ol style="list-style-type: none"> 1. explain the theoretical knowledge and practical skills in operating various woodworking machines, including saws, planers, routers, and sanders 2. differentiate the market forms of timber, such as rough sawn, dressed, and seasoned timber, and understand their characteristics and uses 3. identify descriptions, features, and functionalities of common woodworking machines, including their components and operation 4. make use of safety precautions when working with woodworking machinery, including proper attire, machine setup, and emergency procedures . 5. design principles and techniques for creating woodworking 							

	<p>projects, including drafting, sketching, and using design software</p> <ol style="list-style-type: none"> 6. develop skills in diagnosing and repairing common issues with woodworking machinery, ensuring smooth operation and longevity of equipment 7. assess the economic factors influencing woodworking practices, including material costs, labor expenses, and market demand 8. specify geometrical concepts relevant to woodworking, such as measurements, angles, and geometric shapes, to ensure accuracy and precision in project construction.
<p>Unit I: (Theory) 15 Hours</p>	<p>Woodworking Machines and Basic Woodworking Principles</p> <ul style="list-style-type: none"> • Understanding Woodworking Machines • Functions and Operations • Machine Care and Maintenance • Introduction to Pattern and Design Making • Fundamentals of Repairing Techniques
<p>UNIT-II: (Practical) 30 Hours</p>	<p>Practical Operation of Woodworking Machines</p> <ol style="list-style-type: none"> 1. Demonstration of Woodworking Machines: <ul style="list-style-type: none"> • Observe and understand the operational techniques of various woodworking machines such as drilling, grinding, and mortising machines. 2. Hands on Experience with Drilling Machine: <ul style="list-style-type: none"> • Operate a drilling machine to create precise holes in wood. 3. Hands on Experience with Grinding Machine: <ul style="list-style-type: none"> • Utilize a grinding machine to smooth and shape wooden components. 4. Hands on Experience with Mortiser Machine: <ul style="list-style-type: none"> • Use a mortiser machine to create mortises for joints. 5. Universal Woodworking Machine: <ul style="list-style-type: none"> • Gain proficiency in the use of a universal woodworking machine, understanding its multifunctional capabilities.
<p>UNIT-III: (Practical) 30 Hours</p>	<p>Practical Woodworking Techniques and Repairs</p> <ol style="list-style-type: none"> 1. Pattern and Design Making: <ul style="list-style-type: none"> • Execute pattern and design making techniques on woodworking projects. 2. Marking and Making Window Frames: <ul style="list-style-type: none"> • Practice marking and making window frames, ensuring precision and accuracy. 3. Making Window Shutters: <ul style="list-style-type: none"> • Construct window shutters, applying appropriate woodworking techniques. 4. Repairing Techniques: <ul style="list-style-type: none"> • Perform practical exercises on repairing furniture, doors, windows, and racks. 5. Practical Application of Repairing Skills: <ul style="list-style-type: none"> • Apply theoretical knowledge to real life repairing scenarios,

	improving problem solving skills.
UNIT-IV: (Practical) 30 Hours	<p>Practical Applications of Geometry in Woodworking</p> <p>1. Geometrical Definitions and Properties:</p> <ul style="list-style-type: none"> Understand and apply fundamental geometrical definitions and properties related to angles, triangles, rectangles, squares, rhombuses, and parallelograms. <p>2. Geometric Construction Exercises:</p> <ul style="list-style-type: none"> Conduct exercises involving the construction and analysis of various geometric shapes. <p>3. System of Units:</p> <ul style="list-style-type: none"> Gain proficiency in the system of units for length, area, volume, capacity, weight, time, and angle, including their conversions. <p>4. Measurement and Conversion:</p> <ul style="list-style-type: none"> Perform accurate measurements and conversions between different units of length, area, volume, capacity, weight, and time. <p>5. Practical Geometry Applications:</p> <ul style="list-style-type: none"> Apply geometric principles to practical woodworking tasks, enhancing the precision and quality of the work.
Suggested Readings	<ol style="list-style-type: none"> Andy Engel, “Carpentry Complete: Expert Advice from Start to Finish” Albert Jackson, David Day, and Simon Jennings, “The Complete Manual of Woodworking” Reference Books: Bill Hylton, “Illustrated Cabinetmaking: How to Design and Construct Furniture That Works” Chris Marshall, “The Complete Guide to Carpentry for Homeowners: Basic Carpentry Skills & Everyday Home Repairs”
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