CURRICULUM

FOR THE TRADE OF

CARPENTER

UNDER

APPRENTICESHIP TRAINING SCHEME

सत्यमेव जयते
Government of India

GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENURESHIP
DIRECTORATE GENERAL OF TRAINING

CONTENTS

Sl. No.	Topics	Page No.
1.	Acknowledgement	**3**
2.	Background 2.1 Apprenticeship Training under Apprentice Act 1961 2.2 Changes in Industrial Scenario 2.3 Reformation	**4 - 5**
3.	Rationale	**6**
4.	Job roles: reference NCO	**7**
5.	General Information	**8**
6.	Course structure	**9 - 10**
7.	Syllabus 7.1 Basic Training 7.1.1 Detail syllabus of Core Skill A. Block-I (Engg. drawing & W/ Cal. & Sc.) B. Block-II (Engg. drawing & W/ Cal. & Sc.) 7.1.2 Detail syllabus of Professional Skill & Professional Knowledge A. Block – I B. Block – II 7.1.3 Employability Skill 7.1.3.1 Syllabus of Employability skill A. Block – I B. Block – II 7.2 Practical Training (On-Job Training) 7.2.1 Broad Skill Component to be covered during on-job training. A. Block – I B. Block – II	**11-28**
8.	Assessment Standard 8.1 Assessment Guideline 8.2 Final assessment-All India trade Test (Summative assessment)	**29 - 31**
9.	Further Learning Pathways	**32**
10.	Annexure-I – Tools & Equipment for Basic Training	**33 - 37**
11.	Annexure-II – Infrastructure for On-Job Training	**38**
12.	Annexure-III - Guidelines for Instructors & Paper setter	**39**

1. ACKNOWLEDGEMENT

The DGT sincerely express appreciation for the contribution of the Industry, State Directorate, Trade Experts and all others who contributed in revising the curriculum. Special acknowledgement to the following industries/organizations who have contributed valuable inputs in revising the curricula through their expert members:

1. ……..
2. ……..
3. ……..
4. ……..
5. ……..
6. ……..
7. ……..
8. ……..
9. ……..
10. ……..

Special acknowledgement is expended by DGT to the following expert members who had contributed immensely in this curriculum.

Co-ordinator for the course : R.N.MANNA, Training Officer, CSTARI, Kolkata

Sl. No.	Name & Designation Sh./Mr./Ms.	Organization	Remarks
1.	Supriya Rana, Vocational Instructor	Advanced Training Institute, Kolkata	
2.	Sri Nirmalya Nath, Astt. Director of Trg.	CSTARI, Kolkata	Expert
3.	R.N.Manna, Training Officer	CSTARI, Kolkata	Expert
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

2. BACKGROUND

2.1 Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate(ITI pass-outs) issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry**.** There are four categories of apprentices namely**; trade apprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by NCVT and those successful in the trade tests are awarded the National Apprenticeship Certificate.

The period of apprenticeship training for graduate (engineers), technician (diploma holders and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

2.2 Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger proportion of apprentices, will be critical to success; as will stronger collaboration between industry and the trainees to ensure the supply of skilled workforce and drive development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

2.3 Reformation

The Apprentices Act, 1961 has been amended and brought into effect from 22nd December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.

- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.

- Scope has been extended also to non-engineering occupations.

- Establishments have been permitted to outsource basic training in an institute of their choice.

- The burden of compliance on industry has been reduced significantly.

3. RATIONALE

(Need for Apprenticeship in **CARPENTER** trade)

A Unique Training Process

The Apprenticeship system of training is unique in that it is the only formal, structured, and nationally recognized education and training program available that combines the two most common forms of career and occupational learning: classroom instruction with on-the-job training.

Apprentices not only learn occupational skills in the classroom, their learning is expanded to include hands-on, paid, on-the-job training. Students learn and practice all phases of the trade/occupation in real-world applications.

Apprenticeship is a training strategy that, leads to a certificate of completion and nationally recognized skilled worker status. These credentials have explicit meaning, recognition, and respect in the eyes of Central and State Governments and relevant Industries.

The Apprenticeship Programs train men and women to craftsman status. By participating in a program, apprenticeship training shape applicants with character, aptitude, motivation and good personality traits into competent Craftsmen and Craftswomen who have in-demand skill sets, comprehensive knowledge, positive attitudes and superior abilities.

4. JOB ROLES: REFERENCE NCO

Brief description of Job roles:

7124.10 Carpenter, General makes,assembles, alters and repairs wooden structures and articles according to sample or drawing using hand or power tools or both. Studies drawing or sample to understand type of structure or article to be made and calculates quantity of timber required. Selects timber to suit requirements. Marks them to size using square, scribber etc. Saws, chisels and planes wooden pieces to required sizes and makes necessary joints such as half lap, tenon mortice, dove-tail etc. using saws, planes, mortising, chisels, drills and other carpentry hand or power tools as required. Checks parts frequently with square, foot rule, measuring tape etc. to ensure correctness. Assembles parts and secures them in position by screwing, nailing or doweling. Checks assembled structure with drawing or sample; rectifies defects if any, and finishes it to required specifications. Alters, repairs or replaces components in case of old structures or articles in similar manner. May glue parts together. May smoothen and finish surface with sand paper and polish. May fix metal fittings to structure and polish. May fix metal fittings to structure or article made. May calculate cost of furniture. May sharpen his own tools.

7124.20 **Carpenter, Construction; Carpenter Building** makes, assembles, alters and repairs doors, windows, frames and other wooden fixtures of building using hand or power tools or both. Studies drawings or samples and calculates quantity of timber required. Saws over size pieces by power or hand tools or collects lumbers for making various components. Plans two sides of above pieces, marks off dimensions using tri-square, scribber, pencil etc., and reduces them to required sizes by adzing, sawing and planning. Marks off different members, cuts them as required and shapes and makes tenon and mortise, half lap and other joints by sawing, planing, chiselling, drilling and filling. Checks pieces frequently while sizing and shaping to ensure correctness. Assembles framework step by step by gluing, cramping, dowelling, nailing and screwing as required. Examines finished article for accuracy. Fits metal rods, hinges etc., to wood work where necessary and rectifies defects in fittings if any. Sharpens his own tools. May erect scaffoldings if necessary.

Reference NCO: 2004 / 7124.10, 7124.20

5. GENERAL INFORMATION

1. **Name of the Trade** **: CARPENTER**

2. **N.C.O. Code No.** : 7124.10, 7124.20

3. **Duration of Apprenticeship Training (Basic Training + Practical Training):** 2years

3.1 **For Freshers :- Duration of Basic Training**: -

a) Block –I : 3 months

b) Block – II : 3 months

Total duration of Basic Training: 6 months

Duration of Practical Training (On -job Training): -

a) Block–I: 9 months

b) Block–II : 9 months

Total duration of Practical Training: 18 months

3.2 **For ITI Passed :- Duration of Basic Training**: - NIL

Duration of Practical Training (On -job Training): 12 months

4. **Entry Qualification** : **Passed 8th Standard**

5. **Selection of Apprentices:** The apprentices will be selected as per Apprentices Act amended time to time.

6. Rebate to ITI Passed out Trainees : one year for the trade of **Carpenter**.

Note: Industry may impart training as per above time schedule for different block, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspects is compromised.

6. COURSE STRUCTURE

Training duration details: -

Time (in months)	1-3	4-12	13-15	16-24
Basic Training	Block– I	-----	Block – II	------
Practical Training (On - job training)	----	Block – I	------	Block – II

Components of Training	Duration of Training in Months																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Basic Training Block - I																								
Practical Training Block - I																								
Basic Training Block - II																								
Practical Training Block - II																								

7. SYLLABUS

7.1 BASIC TRAINING
(BLOCK – I & II)
DURATION: 06 MONTHS

GENERAL INFORMATION

1) **Name of the Trade** : **CARPENTER**
2) **Hours of Instruction** : 1000 Hrs. (500 hrs. in each block)
3) **Batch size** : 20
4) **Power Norms** : 8 KW for Workshop
5) **Space Norms** : 120 Sq.mt. for Workshop
6) **Examination** : The internal assessment will be held on completion of each Block.
7) **Instructor Qualification** :

i) Degree/Diploma in **Mechanical.Engg.** from recognized university/Board with one/two year post qualification experience respectively in the relevant field.

OR

ii) NTC/NAC in the trade of **Carpenter** with three year post qualification experience in the relevant field.

Preference will be given to a candidate with Craft Instructor Certificate (CIC)

8) **Tools, Equipments & Machinery required** : - As per Annexure – I

7.1.1 DETAIL SYLLABUS OF CORE SKILL

A. Block– I
Basic Training

Topic No.	a) Engineering Drawing	Duration (in hours)	b) Workshop Science & Calculation	Duration (in hours)
1.	Drawing Instruments : their uses Drawing board, T-Square, Drafter (Drafting M/c), Set Squares, Protractor, Drawing of lines and their application (Hidden, centre, construction, Extension, Dimension, Section) Methods of Division of line segment	**30**	**Properties of Material** : properties -Physical & Mechanical, Types –Ferrous & Non-Ferrous, difference between Ferrous and Non-Ferrous metals, introduction of Iron, Cast Iron, Wrought Iron, Steel, difference between Iron and Steel, Alloy steel, carbon steel, stainless steel, Non-Ferrous Alloys.	**20**
2	Drawing of Geometrical Figures: Angle, Triangle -different types, Rectangle, Square, Rhombus, parallelogram, Circle and its elements.		**Mass, Weight and Density**: Mass, Unit of Mass, Weight, difference between mass and weight, Density, unit of density, specific gravity of metals. **Centre of gravity** and its practical application.	
3	Lettering and Numbering as per BIS SP46-2003: Single Stroke, Double Stroke, inclined, Upper case and Lower case		- Forces definition. - Definition and example of compressive, tensile, shear forces, axial and tangential forces.	
4	Dimensioning: - types and methods of dimensioning (functional, non-functional and auxiliary) - Types of arrowhead - Leader Line with text		**Mensuration :** parallelogram lengths of diagonals of square & rectangles. Pythagoras Theorem, Area and perimeter of square, rectangle, parallelogram, triangle, circle, semi circle. Area of trapezoid,	
5	Method of presentation of Engineering Drawing - Pictorial View - Orthogonal View - Isometric view		Volume of solids – cube, cuboids, cylinder and Sphere. Surface area of solids – cube, cuboids, cylinder and Sphere. .	

6	Symbolic Representation (as per BIS SP:46-2003) of : - Fastener (Rivets, Bolts and Nuts) - Bars and profile sections - Weld, brazed and soldered joints. - Electrical and electronics element - Piping joints and fittings		- Area of cut-out regular surfaces: circle and segment and sector of circle.	
7	Construction of Geometrical Drawing Figures: - Polygons and their values of included angles. - Conic Sections (Ellipse)		- Volume of simple solid blocks - Volume of cut-out solids: hollow cylinders, frustum of cone, block section.	
8	Drawing of Solid figures (Cube, Cuboids, Cone and Frustum of Cone) with dimensions.		**Work, Power and Energy**: work, unit of work, power, unit of power, Horse power, energy, use of energy, potential and kinetic energy, examples of potential energy and kinetic energy.	
9	Free Hand sketch of hand tools and measuring tools used in the trade.		**Friction** – Limiting frication – measuring of friction – examples. Simple problems on straight and bell crank levers. Laws of friction, co-efficient of friction and angle of friction. Problems on inclined plane.	

B. Block- II
Basic Training

Topic No.	a) Engineering Drawing	Duration (in hours)	b) Workshop Science & Calculation	Duration (in hours)
1	Drawing of riveted joints, different types of threads, bolts, nuts, locking devices, keys, cotters, couplings, bearings, pulleys cotters screw joint, knuckle joint etc. Making drawings of lap and butt and single or double strap riveted joints.	**30**	stress, strain and modules of elasticity, ultimate, strength, factor of safety and different types of stresses	**20**
2	- Construction of simple curves of interpretation-simple exercises. - Development of surfaces of prism, cylinders, pyramids and cones		Elementary principle of triangle of forces and parallelogram of forces. Resolution and composition of forces. Application to lifting tackles like chain pulley block, crane, wall crane, etc. problems. Moment of a force-couples-simple problems. Example in simply supported and loaded beams-General conditions of equilibrium for a series of forces acting on a body. Stable, non stable and neutral equilibrium of bodies-simple explanation.	
3	- Reading of advanced blue prints including structural drawings and other allied items such as materials, list.		Heat and temperature, their units, difference between heat and temperature, boiling point, melting point, scale of temperature, relation between different scale of temperature, Thermometer, pyrometer, Expansion of solids, liquids and gases due to heat, co-efficient of expansion. Brief description of transference of heat-conduction, convection and radiation.	
4	- Drawings of fabricated channels or I section Girders. - Drawings of fabricated channels simple poof trusses, purlins, braced columns glazing or window frames and welded girders.		Electricity and its various effects. Electric current-positive and negative terminals, use of switches and fuses. Types of current- AC, DC, Units of current, resistance and voltage; Simple electric circuit-Ohm's law-simple calculation. Conductor, insulator, Types of connections – series, parallel,	

			electric power, Horse power, energy, unit of electrical energy. Concept of earthing.	
5	- Drawing of fabricated jobs like brackets, bed plates. -		**Trigonometry:** Trigonometric ratios, Trigonometric tables. - Finding the value of unknown sides and angles of a triangle by Trigonometrical method. - Finding height and distance by trigonometry. - Application of trigonometry in shop problems. (viz. taper angle calculation).	
6	-		**Levers and Simple Machines:** levers and its types. Simple Machines, Effort and Load, Mechanical Advantage, Velocity Ratio, Efficiency of machine.	

7.1.2 DETAIL SYLLABUS OF PROFESSIONAL SKILLS & PROFESSIONAL KNOWLEDGE

A. Block –I

Basic Training

Week No.	Professional Skills (275 hrs.)	Professional Knowledge (120 hrs.)
1	**Familiarization with the workshop:** Wood working sections and wood working machine shop . show different exercises / jobs done by the trainees in the previous year batches etc. show different audio – visual aids, library, show room etc. **Identification** and **Familiarization** of hand tools. Demonstration and use of measuring, marking and testing tools.	**Safety precautions:** Safety precaution of the carpentry hand tools. Workshop discipline and safety, first aid etc. Introduction to the trade and to carpentry hand tools, their classification, names and the uses. Measuring, marking and testing tools, types, sizes, uses, etc **Introduction to timber** : growth of a trees, cross-section of an exogenous tree trunk, parts, formation. Parts of a tree. Functions and identification of timber and defects , diseases of timber VIZ. Knots , shakes, grains etc.
2	**Sawing practice** : - use of different types of the saws Ripping, cross cutting, curve cutting, oblique sawing etc.; Use of the bench hook, bench vice, bench stop etc. Sharpening and the setting of the different types of the saws. **Hand Tools and portable power tools - curve cutting saws: compass** saw, coping saw, bow saw, fret saw etc. - description, types, size, use, care and maintenance. Sharpening and setting of saws. Portable circular saw and its uses.	**Saw and the Plane** : description, types, sizes, setting, sharpening, uses, etc. **Special saws** - Compass saw, coping saw, Bow saw, fret saw portable circular saw.
3	**Planning practice** Demonstration and uses of the planes . Setting of the plane holding, Planing techniques. Planing face side, face edge, use of marking gauge etc. Testing of the accuracy, flatness and twistness of the surface. Use of straight edge, bench stop, try square, winding strips, cross planing, edge planing etc. Grinding and sharpening of the plane blades. Application of Portable power planer machine.	**Different types of Plane** : description, types, sizes, setting, sharpening, uses, etc. **Special planes:-** Compass plane Moulding plane, Rebate plane, Grooving plane etc. - description, type, size, use, care and maintenance. Portable power planer machine and its uses
4	**Chiseling Practice** **And multiple chiseling practice:** Demonstration and use of different types of chisels. Chiseling along the grain, across the grain of the vertical, horizontal etc. Grinding, sharpening and honing of chisel. **Holding tools** - Clamps, 'G' or 'C' clamp or cramp, sash /'T' bar cramps , saw sharpening vice, carpentry vice etc.	**Hand tools (paring tools);**: Different types of The chisels ,description , sizes, uses. Grinding, sharpening & honing etc. **Striking tools** - Hammers, mallets etc. **Workshop appliances** : work bench, bench vice, bench hook, bench stop shooting board, MITRE board etc. - types, sizes , uses etc.

5	**Joint practice:- Demonstration and making framing joints** :- Halving joints, trenching and housing joints, Mortise and tenon joints, plain hunched tenon and mortise, MITRE tenon and mortise joint, stub tenon, bare faced tenon, bridle joints etc. (any three of the tenon and mortise joint)	Classification and grading of timbers as per ISI. types of the grains. Joineries: Classification of joint (framing, Angle broadening and the lengthening) **Framing Joints:-** Halving, Mortise and tenon joints, Briddle joints- description, types and uses.
6	**Demonstration and making Dovetail joints –** 1) Housing joints ,2) Dovetail joints- Dovetail marking and its applications. Single dovetail, Common dovetail, lapped dovetail, secret mitre dovetail joints, use of dovetail template etc. (any three)	**Angle joint**: - Description, types size, uses etc. **Seasoning of Timber:** Types, advantages and disadvantages, stacking (vertical and horizontal) Moisture content in timber and its effect on timber, moisture meter and oven method. Characteristics of wood, Physical and mechanical properties of wood, qualities of good timber.
7	**Broadening joints:** Demonstration and making different types of broadening joints - simple butt, riveted butt, pocket screw, secret pocket butt joint, glued butt, tongue and groove joints etc. **Lengthening joints demonstration and making:** **Different types of scarf joints** - Table scarf, bevel scarf etc.	Broadening joints - description, types, and uses. Adhesives - types, uses etc. **Lengthening joints:** **Different types of scarf joints** – Description and types of Table scarf, bevel scarf, tension scarf etc**.**
8	**A frame of using different type of joints -** Small article involving above joints may be made. **Simple wooden furniture making work:** Demonstration and practice on - Making a small wall bracket. Prepare chalk box. Tea tray or office Tray.	**Preservation of timber:** Chemical treatment of timber - types, process etc. and preservatives used. **Files**: Types, grades, uses, care and maintenance. Uses of electrical portable jig saw , portable disc sander, portable electrical drill machine.
9	**Application of boring tools:** Use of country drill, hand drill, ratchet brace, breast drill. Portable electric drill machine and its uses. Use of different types of drill bits, hand augur, layout of a stool and make cutting list. Prepare a standard height. Taper legged stool as per lay out. Use of Adhesives.	**Boring tools :** Description and types- Country drill, hand drill, ratchet brace, breast drill – parts, functions, size and use. Portable electric drilling machine - description, uses etc. Drill bits - type, size and uses. Calculation of timber required for stool. Prepare cutting list from drawing (sawn size and finish size). Hand augur – description, size & uses.
10	Demonstration and make layout of different furniture. Making notice board or display board. Use of hard board, ply wood and insulation board. Making a small rack/modern wall unit.	Description of timbers used in furniture making work: - Teak, Sal, Deodar and other wood as available in the local market. **Conversion of timber :** Parallel sawing, radial sawing, quarter sawing, tangential sawing etc. Design of Furniture's for different purpose :- Bed room, dining Hall, Library, Office, Work-

		shop, Class room.
11	Wood carving exercises and use of carving tools and their sharpening.	Tools required for carving ornamental works. Properties of wood. Preparation of bill of materials and simple estimation.
12	**Preparation of surface** - use Smoothing plane for knotty or interlocked cross grained timber by scraping, sand papering and portable sander application on finished surface. Varnishing on finished surface. **Furniture polishing**:- Demonstration on how to make French polish, use of French polish and wax polish. Remove the polish and Re-polishing old furniture.	Method of preparation of surface for staining, tools and equipment required. **Sand paper** - types, grades, size & uses. Portable sander machine and uses. Preparation of putty and use. **Staining**:- Type, process, methods and staining materials. Different staining methods applied for different timber. Description of French polish, wax polish, types and uses. Estimation of timber
13.	**Revision**	
	Internal Assessment 03days	

B. Block –II
Basic Training

Week No.	Professional Skills (275 hrs.)	Professional Knowledge (120 hrs.)
1 -2	**Introduction &demonstration**, operational techniques of wood working machines. Uses of:- A) Band saw: - remove and refit of band saw blades setting and grinding and different Operation :- Ripping ,. Cross-cutting, curve cutting, beveling, chamfering etc. B) Circular Saw: - Ripping, cross cutting, rebating , grooving etc. C) Planning Machine :- Surfacing, thicknessing, chamfering, edging beveling etc, D) Wood Turning lathe: - Use of turning tools, plain turning, taper turning and Turning different articles- Chisel handles, table lamp stand etc. Use of face plate, chuck etc.	**Wood working machines**: Description, types, sizes, parts, functions, operations. Safety precautions, care and maintenance. Oiling, greasing etc. of the following machines: A) Band Saw B) Circular saw C) Planning machine D) Wood Turning Lathe with Turning tools. Market form of timber. Conversion of timber method, advantages, disadvantages.
3 - 4	**Demonstration and use of following-** A) Drilling Machine: Use of straight shank drills, taper shank drills, counter sinking bits etc. B) Grinding Machines :- Grinding of different types of tools, cutters, materials for jobs. C) Mortiser Machine. D) Universal wood working Machine.	**Description, types, sizes, parts, functions, operations, safety precautions, care and maintenance etc. of the following machines-** A) Drilling Machine. B) Grinding Machine. C) Mortiser Machine. D) Universal wood working Machine. Calculation of timber – weight, area, volume etc
5	**Exercises.** Identification of pattern making hand tools, use of contraction rule, show different type of pattern. Lay out of simple solid pattern on layout board. Making patterns as per checked layout. (Take help of wood working machines as much as possible.) **L**ayout of split patterns. Marking and making split patterns. Making dowels for above pattern. Use of dowel pin. Use of nail, screws etc. Making templates. Use required machine wherever necessary.	**Introduction to pattern making** Hand tools. Contraction rule and different allowances. Shrinkage, drafting, machine allowances. Different types of timbers used in pattern making. Reading of blue print. Layout board and its use. Types of pattern and their uses. **Split patterns** -Types and uses. **Dowel-** types, size and uses in pattern making work.
6	Marking and making patterns with self core and with core prints. Prepare core box and pattern. 1) Casting pattern 2) Machining position core print.	**Core and core prints**: Types & uses. Colour code as per IS specifications. Use of paints on pattern core, core box, core prints etc. Estimate volume of

	Painting the pattern, core box etc. as per IS specifications.	wood and other requirements for pattern making box.
7- 8	**CARPENTRY BUILDING WORK** Revision of basics joints related with carpentry building work. Marking and making door frame and door shutter. Making panel door, glazed shutter and fitting mouldings after fitting glass. Fitting produce used in door construction.	Introduction about carpentry work involved in building construction. Types of doorframes, door shutters- description, sizes, uses, advantages and disadvantages etc. Fittings used in door. Types of panels used in panel shutter, glazed shutter. **Familiarization with the materials which is used in industries as substitute of wood.** Characteristics of material, Mechanical properties, durability, Applications, etc.
9 – 10	Marking and making window frame and window shutters, use of protection bars. Exercises on roof trusses – Lay out marking roof trusses in reduced scale (Model types)- king post ,queen post etc.	Types of window frame and window shutters. Protection bars: types and uses. Roof trusses: King post, queen post etc. related terms, sizes construction etc.
11- 12	Exercises on simple floor construction and joints used therein. Exercises on partition construction. Repairing practice: Repair and reconditioning of :- 1. Hand tools and equipments. 2. Furniture, doors and windows.	Basic principle of repairing work and repairing technique of furniture, door, window, rack etc. Use of Nails, screws angle plate, bracket, nuts, bolts etc. for repairing work. Packing case:-Types, material and tools used. Types of hanging plates, corner plates etc. used in carpentry work. Economical factors and material estimate.
13.	**Revision**	
	Internal Assessment 03 days	

7.1.3 EMPLOYABILITY SKILLS

GENERAL INFORMATION

1)	**Name of the subject**	**:**	**EMPLOYABILITY SKILLS**
2)	**Applicability**	**:**	ATS- Mandatory for fresher only
3)	**Hours of Instruction**	**:**	**110 Hrs. (55 hrs. in each block)**
4)	**Examination**	**:**	The examination will be held at the end of two years Training by NCVT.
5)	**Instructor Qualification**	**:**	

i) MBA/BBA with two years experience or graduate in sociology/social welfare/Economics with two years experience and trained in Employability skill from DGET Institute.

And

Must have studied in English/Communication Skill and Basic Computer at 12th /diploma level

OR

ii) Existing Social Study Instructor duly trained in Employability Skill from DGET Institute.

7.1.3.1 SYLLABUS OF EMPLOYABILITY SKILLS

A. Block – I
Basic Training

Topic No.	Topic	Duration (in hours)
	English Literacy	**15**
1	**Pronunciation :** Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)	
2	**Functional Grammar** Transformation of sentences, Voice change, Change of tense, Spellings.	
3	**Reading** Reading and understanding simple sentences about self, work and environment	
4	**Writing** Construction of simple sentences Writing simple English	
5	**Speaking / Spoken English** Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Cardinal (fundamental) numbers ordinal numbers. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.	
	I.T. Literacy	**15**
1	**Basics of Computer** Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.	
2	**Computer Operating System** Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications.	
3	**Word processing and Worksheet** Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document. Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets	
4	**Computer Networking and INTERNET** Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites	

	and its implication. Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes.	
	Communication Skill	**25**
1	**Introduction to Communication Skills** Communication and its importance Principles of Effective communication Types of communication - verbal, non verbal, written, email, talking on phone. Non verbal communication -characteristics, components-Para-language Body - language Barriers to communication and dealing with barriers. Handling nervousness/ discomfort. Case study/Exercise	
2	**Listening Skills** Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening. Triple- A Listening - Attitude, Attention & Adjustment. Active Listening Skills.	
3	**Motivational Training** Characteristics Essential to Achieving Success The Power of Positive Attitude Self awareness Importance of Commitment Ethics and Values Ways to Motivate Oneself Personal Goal setting and Employability Planning. Case study/Exercise	
4	**Facing Interviews** Manners, Etiquettes, Dress code for an interview Do's & Don'ts for an interview	
5	**Behavioral Skills** Organizational Behavior Problem Solving Confidence Building Attitude Decision making Case study/Exercise	

B. Block– II
Basic Training

Topic No.	Topic	Duration (in hours)
	Entrepreneurship skill	**15**
1	**Concept of Entrepreneurship** **Entrepreneurship**- Entrepreneurship - Enterprises:-Conceptual issue Entrepreneurship vs. Management, Entrepreneurial motivation. Performance & Record, Role & Function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.	
2	**Project Preparation & Marketing analysis** Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of Product Life Cycle (PLC), Sales & distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.	
3	**Institutions Support** Preparation of Project. Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.	
4	**Investment Procurement** Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.	
	Productivity	**10**
1	**Productivity** Definition, Necessity, Meaning of GDP.	
2	**Affecting Factors** Skills, Working Aids, Automation, Environment, Motivation How improves or slows down.	
3	**Comparison with developed countries** Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.	
4	**Personal Finance Management** Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.	
	Occupational Safety, Health & Environment Education	**15**
1	**Safety & Health** Introduction to Occupational Safety and Health importance of safety and health at workplace.	

2	**Occupational Hazards** Basic Hazards, Chemical Hazards, Vibro-acoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.	
3	**Accident & safety** Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.	
4	**First Aid** Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person	
5	**Basic Provisions** Idea of basic provision of safety, health, welfare under legislation of India.	
6	**Ecosystem** Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.	
7	**Pollution** Pollution and pollutants including liquid, gaseous, solid and hazardous waste.	
8	**Energy Conservation** Conservation of Energy, re-use and recycle.	
9	**Global warming** Global warming, climate change and Ozone layer depletion.	
10	**Ground Water** Hydrological cycle, ground and surface water, Conservation and Harvesting of water	
11	**Environment** Right attitude towards environment, Maintenance of in -house environment	
	Labour Welfare Legislation	**5**
1	**Welfare Acts** Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act.	
	Quality Tools	**10**
1	**Quality Consciousness :** Meaning of quality, Quality Characteristic	
2	**Quality Circles :** Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles.	
3	**Quality Management System :** Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.	
4	**House Keeping :** Purpose of Housekeeping, Practice of good Housekeeping.	
5	**Quality Tools** Basic quality tools with a few examples	

7.2 PRACTICAL TRAINING (ON-JOB TRAINING)
(BLOCK – I & II)
DURATION: 18 MONTHS (9 months in each block)

GENERAL INFORMATION

1. **Name of the Trade** : **Carpenter**

2. **Duration of On-Job Training** : a) Block–I: 9 months
   b) Block–II : 9 months
   Total duration of Practical Training: 18 months

3. **Batch size** : a)Selection of Apprentices as per apprenticeship guidelines.
   b) Max. 20 trainees per group

4. **Examination** : i) The internal assessment will be held on completion of each block
   ii) NCVT exam will be conducted at the end of 2nd year.

5. **Instructor Qualification** :

Degree/Diploma in **Mechanical Engg.** from recognized university/Board With one/two year post qualification experience in the relevant field.
OR

NTC/NAC in the trade of **Carpenter** with three year post qualification experience in the relevant field.

Preference will be given to a candidate with Craft Instructor Certificate (CIC)

6. **Tools, Equipments & Machinery required** : - As per Annexure – II

7.2.1 BROAD SKILL COMPONENT TO BE COVERED DURING ON-JOB TRAINING

A. BLOCK – I

1.	Revision of basic skills/operations done in the 1st year. Introduction in safety precautions in the shop floor. Making a template and layout of a job.
2.	Using of special hand tools – use of bow saw, fret saw, key hole saw etc. use of planes, shoulder plane, plough planes, compass planes, router etc. Chisels – bearing tools, bit, expansion bit etc. use of carving hand tools.
3.	Grinding and sharpening of hand tools, plane cutter chisels, cutters for rebate planes, molding planes. Sharpening and setting of different types of saws.
4..	Stacking and seasoning of timber.
5.	Carving of simple figures.
6.	Use of laminated sheet – block boards, ply-wood, sunmica sheets, ply veneer, insulation boards, High density and Medium density board etc. Veneering and its use.
7.	Use of different types of wood screws, nails, coach screws etc. Preparation of wooden dowels and their uses, use of metal dowels.
8.	Fittings of hinges, locks, handles, fasteners, tower bolts, flush bolts, castors, hasp and staple, door rings etc.
9.	Preparation of bill of material of different jobs, estimation and costing.
10.	Marking out and of Tusk tenon and mortise joint. Preparation of different types of dovetail joints, common dovetail, lapped dovetail, secret dovetail, splay dovetail.
11.	Use of electrical portable machine such as portable circular saw machine, plainning machine, drill machine, sander machine, router machine, fret saw machine, etc.
12.	Making furniture: stool, tray, tables etc. Marking and making decorative book shelve, rack and cabinet etc.

13.	Making writing table with drawer and cupboard, fitting of drawer lock, hinges, cupboard lock etc.
14.	Making chairs/armless. Varnishing and polishing.

B. BLOCK – II

1.	Preparation of door frame and door shutters. Making window frame and window shutters.
2.	Construction of floor.
3.	Layout and making of partition.
4.	Construction of stair cases.
5.	Making ceiling. Fixing hard board or any insulation board, use different moldings to cover joint.
6.	Construction of louvers. Construction of sky and latern roof light.
7.	Making roof truss and construction. Construction of shuttering (from work).
8.	Timbering of trench.
9.	Storage and preservation of different types of timber.
10.	Use of wood working machines including circular saw machine, surface planer and thicknesser machine / jointer planning machine, mortising (chain and hollow chisel) tenoing machines, band saw, fret saw machine, spindle moulder m/c, wood turning lathe, universal wood working machine.
11.	Sand papering and finishing surface for applying wood finishing materials. Sponging the surface, filling up the nail holes and cracks etc. Staining.
12.	French / Wax polishing. Laquar finishing. Painting.
13.	Pattern Making, Core, and Core Print.
14.	Use and care of portable power hand tools.
15.	Working to simple architectural drawing. Simple fitting work, sheetmetal work.

8. ASSESSMENT STANDARD

8.1 Assessment Guideline:

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking assessment. Due consideration to be given while assessing for team work, avoidance/reduction of scrape/wastage and disposal of scarp/wastage as per procedure, behavioral attitude and regularity in training.

The following marking pattern to be adopted while assessing:

a) Weightage in the range of 60-75% to be allotted during assessment under following performance level:

For this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.

In this work there is evidence of:

- good skill levels in the use of hand tools, machine tools and workshop equipment
- many tolerances while undertaking different work are in line with those demanded by the component/job.
- a fairly good level of neatness and consistency in the finish
- occasional support in completing the project/job.

b) Weightage in the range of above75%- 90% to be allotted during assessment under following performance level:

For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship.

In this work there is evidence of:

- good skill levels in the use of hand tools, machine tools and workshop equipment
- the majority of tolerances while undertaking different work are in line with those demanded by the component/job.
- a good level of neatness and consistency in the finish
- little support in completing the project/job

c) Weightage in the range of above 90% to be allotted during assessment under following performance level:

For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.

In this work there is evidence of:

- high skill levels in the use of hand tools, machine tools and workshop equipment
- tolerances while undertaking different work being substantially in line with those demanded by the component/job.
- a high level of neatness and consistency in the finish.
- minimal or no support in completing the project

8.2 FINAL ASSESSMENT- ALL INDIA TRADE TEST (SUMMATIVE ASSESSMENT FOR TWO YEARS TRADE)

SUBJECTS	Marks	Sessional Marks	Full Marks	Pass Marks	Duration of Exam.
Practical	300	100	400	240	**08 hrs.**
Trade Theory	100	20	120	48	3 hrs.
Workshop Cal. & Sc.	50	10	60	24	3 hrs.
Engineering Drawing	50	20	70	28	4 hrs.
Employability Skill	50		50	17	2 hrs.
Grand Total	**550**	**150**	**700**	**-**	

Note: - The candidate pass in each subject conducted under all India trade test.

9. FURTHER LEARNING PATHWAYS

- On successful completion of the course trainees can opt for Diploma course (Lateral entry).
- On successful completion of the course trainees can opt for CITS course.

Employment opportunities:

On successful completion of this course, the candidates shall be gainfully employed in the following industries:

1. Production & Manufacturing industries.
2. Building & Construction / Structural / Fabrication industries
4. Service industries.
5. Ship building and repair
6. Infrastructure and defence organisations
7. In public and private sector industries of related field in India & abroad.
8. Self employment

ANNEXURE – I

10.TOOLS & EQUIPMENT FOR BASIC TRAINING

INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

TRADE: CARPENTER

LIST OF TOOLS & EQUIPMENTS FOR 20 APPRENTICES

A : TRAINEES TOOL KIT:-

Sl. No.	Name of the items	Quantity (indicative)
1.	Foot rule (two ft. Four fold)/ steel rule	21 Nos.
2.	Marking knife, 200 mm. Length	21 Nos.
3.	Carpenter square 200 mm	21 Nos.
4.	Square, bevel 50 mm	21 Nos.
5.	Carpenter making gauge	21 Nos.
6.	Carpenter mortice gauge	21 Nos.
7.	Saw hand 450 mm.	21 Nos.
8.	Saw tenon 300 mm.	21 Nos.
9.	Plane, jack metal 335 mm. X 50 mm cutter	21 Nos.
10.	Plane smoothing, metal 200 mm. X 50 mm cutter.	21 Nos.
11.	Chisel, firmer (bevel) edge 6 mm. 10,15,20 and 25 mm.width (5 nos.)	21 Nos.
12.	Chisel, mortice, 06,10,15 mm. (3 nos)	21 Nos.
13.	Screw driwer 300 mm. (cabnit maker)	21 Nos.
14.	Mallet medium size	21 Nos.
15.	Claw hammer 500 gr.	21 Nos.
16.	Oilstone(carborundum) universal silicon carbite combinationrough and fine 200x 50x25 mm	21 Nos.
17.	Hand brush for bench cleaning 450 mm.	21 Nos.

B : TOOLS INSTRUMENTS AND GENERAL SHOP OUTFITS

Sl. No.	Name of the items	Quantity (indicative)
18.	Measuring tape 3 meter	01 no.
19.	Contruction scale 1 meter	04 nos.
20.	Spring caliper inside 150 mm	04 nos.
21.	Spring caliper out side	04 nos.
22.	Wing compass 300 mm.	02 nos.
23.	Trammel Point	02 pair
24.	Sprit level 300 mm.	02 nos.
25.	Rip saw 600 mm.	04 nos.
26.	Cross cut saw mm	02 nos.
27.	Key hole saw 250 mm.	02 nos.
28.	Fret saw frame 150 mm.	02 nos.
29.	Compass saw 350 mm.	04 nos.
30.	Adze 15 kg.	04 nos.
31.	Trying plane metal 450 mm. X 60 mm. Cutter	02 nos.
32.	Plane ravvet adjustable 250 mm. X meters x 9 mm. Cutters.	04 nos.
33.	Plough plane with set of 8 cutter up to 12 mm. Width	04 nos.
34.	Spoke shaves 50 mm. Cutter	08 nos.
35.	Plane adjustable circular 250 mm	04 nos.
36.	Router plane	04 nos.
37.	Cabinet screper 100 mm.	04 nos.
38.	Gauge chisel, scribing 6,10,12,16,20,mm.	08 sets
39.	Ball pein hammer 600 gm.	04 nos.
40.	Cross pein hammer 600 gms.	04 nos.
41.	Screw driver 450 mm.	04 nos.
42.	Screw driver 250 mm.	04 nos.
43.	Screw driver 150 mm.	04 nos.
44.	Pincer 50 mm.	04 nos.
45.	File half round 2 nd cut 250 mm.	08 nos.
46.	File half round wood rasp bastad mm.	08 nos.
47.	File slim taper 100 mm	12 nos.
48.	File slim taper 150 mm.	12 nos.
49.	Card file (steel) wire brush for file	04 nos.
50.	Hands drill 6 mm. Capacities	08 nos.
51.	Country drill with bow (ball bearing type)	04 nos.
52.	Ratchel brace 250 mm. Swap	04 nos.
53.	Hand auger 10,12,14,16,18,20,22,25 mm	02 sets
54.	Centre bits 6,8,10,12.	02 sets
55.	Expansion bit sets	02 sets
56.	Twist drill bits 6,8,10,12, mm	02 sets
57.	Counter sink bit rose type 12 mm.	04 nos.
58.	Breast drill 6 mm.capacity	02 nos.
59.	Centre punch 5	04 nos.
60.	Plunger saw set / pistol grip type.	02 nos.

61.	Number punch 12 mm.	02 stes
62.	Slip stone 100 mm.	08 nos.
63.	Round crow bar with chisel and claw end 1070 x 25 mm.	02 nos.
64.	‘ G’ clamp 100.	08 nos.
65.	‘G’ clamp 150 mm.	08 nos.
66.	‘G’ clamp 250 mm.	04 nos.
67.	‘T’ bar cramp 0.6 meter	08 nos.
68.	‘T’ bar cramp 1.25 meter	04 nos.
69.	‘T’ bar cramp 1.75 meter	02 nos.
70.	Carpenter vice 250 mm jaws	16 nos.
71.	Saw sharpening vice 250 jaws. / 350mm with wooden jaws	02 nos.
72.	Carving tools set.	04 sets
73.	Goggles pair	02 nos.
74.	Glass cutter	02 nos.
75.	Nail punch	04 nos.
76.	Surface plate 600 x 600 mm.	01 no.
77.	Carpenter’s work bench 2400x920x800 mm. Height	08 nos.
78.	Oil can	04 nos.
79.	Drills chuck 12 mm capacities	01 no.
80.	Moisture meter	01 no.
81.	Greese gun	01 no.
82.	Spanner double ended set of 14	01 set
83.	Electrical drying oven (small type).	01 no.

C : GENERAL MACHINERY INSTALLATIONS:-

Sl. No.	Name & Description of Machines	Quantity (indicative)
1.	Portable circular saw machine	02 nos.
2.	Portable planing machine	02 nos.
3.	Power drill machine	02 nos.
4.	Portable sander machine	01 no.
5.	Portable jig saw machine	02 nos.
6.	Portable router machine	01 no.
7.	Power screw driver	02 nos.
8.	Combind surfacer and thickner / jointer planning machine	01 no.
9.	‘Lathe, wood turning.’ 150 mm height of centres 1.75-meter bed, Motorised complete with a set of turning tools.	03 nos.
10.	Tenoning machine (single ended)	01 no.
11.	Mortising machine (combine hollow chisel and chain)	01 no.
12.	Bench Grinder 200 mm.wheel dia. pedestal	01 no.

13.	Drill machine 12 mm. Capacity	01 no.
14.	Portable electric drill 6 mm. Capacity (woif type)	01 no.
15.	Portable discsander 200 mm. Dia	01 no.
16.	Adjustable saw sharpener	01 no.
17.	Electric heater 1000/1500 w 1 nos.102. Electric blower (portable)	01 no.
18.	Universal wood working machine	01 no.
19.	Band saw machine	01 no.
20.	Automatic band saw sharpening machine	01 no.
21.	Band saw brazing or shouldering machine	01 no.

Note: In case of basic training setup by the industry the tools, equipment and machinery available in the industry may also be used for imparting basic training.

INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND ENGINEERING DRAWING

TRADE: CARPENTER

LIST OF TOOLS & EQUIPMENTS FOR 20 APPRENTICES

1) **Space Norms** : 45 Sq. m.(For Engineering Drawing)

2) Infrastructure:

A : TRAINEES TOOL KIT:-

Sl. No.	Name of the items	Quantity (indicative)
1.	Draughtsman drawing instrument box	21 nos.
2.	Set square celluloid 45^0 (250 X 1.5 mm)	21 nos.
3.	Set square celluloid 30^0-60^0 (250 X 1.5 mm)	21 nos.
4.	Mini drafter	21 nos.
5.	Drawing board (700mm x500 mm) IS: 1444	21 nos.

B : FURNITURE REQUIRED

Sl. No.	Name of the items	Quantity (indicative)
1.	Models : Solid & cut section	as required
2.	Drawing Table for trainees	as required
3.	Stool for trainees	as required
4.	Cupboard (big)	01
5.	White Board (size: 8ft. x 4ft.)	01
6.	Trainer's Table	01
7.	Trainer's Chair	01
8.	Class room Chair	20 nos
9.	Class Room table	20 nos

ANNEXURE – II

11. INFRASTRUCTURE FOR ON-JOB TRAINING

TRADE: CARPENTER

For Batch of 20 APPRENTICES

Actual training will depend on the existing facilities available in the establishment. However, the industry should ensure that the broad skills defined against On-Job– Training part (i.e. 9 months + 9 months) are imparted. In case of any short fall the concerned industry may impart the training in cluster mode / in any other industry / at ITI.

ANNEXURE-III

12. GUIDELINES FOR INSTRUCTORS AND PAPER SETTERS

1. Due care to be taken for proper & inclusive delivery among the batch. Some of the following some method of delivery may be adopted:

A) LECTURE
B) LESSON
C) DEMONSTRATION
D) PRACTICE
E) GROUP DISCUSSION
F) DISCUSSION WITH PEER GROUP
G) PROJECT WORK
H) INDUSTRIAL VISIT

2. Maximum utilization of latest form of training viz., audio visual aids, integration of IT, etc. may be adopted.

3. The total hours to be devoted against each topic may be decided with due diligence to safety & with prioritizing transfer of required skills.