Industrial Training Institute
CARPENTER

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

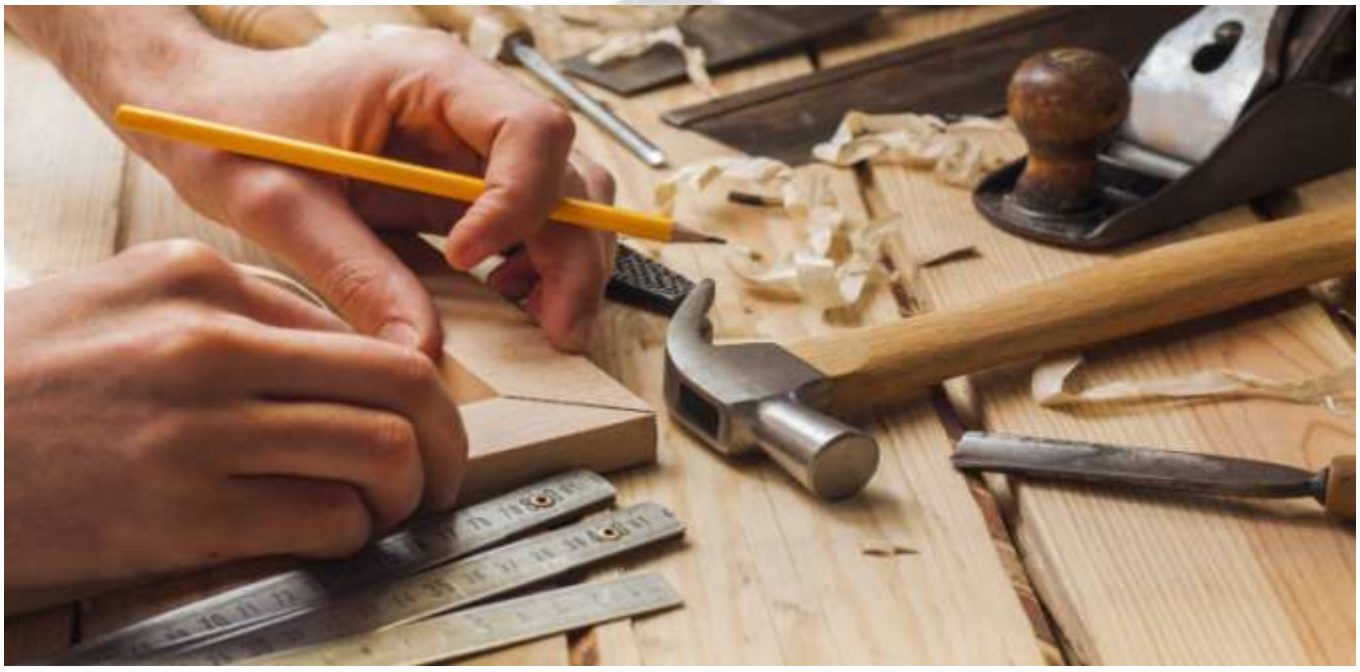
COMPETENCY BASED CURRICULUM

CARPENTER

(Duration: One Year)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 4



SECTOR – CONSTRUCTION, CONSTRUCTION MATERIAL & REAL ESTATE

Industrial Training Institute

Directorate General of Training

Skill India
कौशल भारत - कुशल भारत

CARPENTER

(Engineering Trade)

(Revised in 2018)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL - 4

Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
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List of Expert members participated for finalizing the course curricula of Carpenter trade held on 3rd May 2017 at CSTARI, Kolkata

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2.	Tushar Bagchi, Principal	L & T Construction Skill Training Institute, Kolkata	Member
3.	Rajib Nath, Curator "E"	Birla Industrial & Technological Museum, Kolkata	Member
4.	Abhishek Chatterjee, Human Resource Executive	The Park, Kolkata	Member
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CONTENTS

1. COURSE INFORMATION

During one year duration of "Carpenter" trade, a candidate is trained on Professional Skill, Professional Knowledge and Employability Skill. In addition to this, a candidate is entrusted to undertake project work, extracurricular activities and on-the-job training to build up confidence. The broad components covered related to the trade are categorized in two semester each of six months duration. The semester wise course coverage is categorized as below: -

1st Semester – In the first semester, trainee learns about elementary first aid, fire fighting, environment regulation and housekeeping etc. The trainee identifies timber/ wood, apply measuring, marking and testing instrument and other holding and supporting hand tools. He will be able to use various saws and portable power saw machines for Ripping, cross cutting, Oblique sawing and curve cutting etc. He will be able to analyze the surface finish with exact sizing by planning operation and apply various shaving tools or portable power planning machine. The trainee can apply various paring tools and analyze and choose the positioning and employ holding device for chiselling with better finish. He will be able to identify and classify various types of joints, analyze and prepare correct joint at correct position, related with strength and appearance. He will be able to make small wooden job as per drawing with schedule sizes of timber or alternatives of timber i.e. FRP, MDF, FOAM using various hardware, analyze and use various carving tools and convert a wooden block/ piece into a decorative article. The trainee will be able to preserve wooden item through surface finishing with various processes such as painting, polishing, varnishing etc.

2nd Semester– In the second semester, trainee learns ripping, cross cutting, curve cutting etc. on band saw/ circular saw machine and grinding and setting of blade/ cutter. He can perform different operations on planning machine along with sharpening blades. (Range of operations – Surfacing, thickening, chamfering, edge bending etc.). The trainee can work on pedestal grinder (Range of operations – grinding of mushroom head, cutting edge of tools, drills, etc.). He can make holes of different sizes in correct location on wood work, can perform different operations on wood turning lathe along with sharpening of cutting tools. The trainee can do different operations on Tenon and mortise machine, Sanding machine. He will be able to prepare different types of pattern, core box, core print etc. for moulding application with proper allowances and colour codes. Can produce component involving different operations of fitting and sheet

metal work and check for functionality. The trainee will be able to prepare various roof truss, door and windows frame and shutters, assembling & fixing (wooden/ aluminium or PVC), Paint various door, windows frame, stair and furniture (wooden or aluminium), Prepare various type of wooden floor, partition wall etc. He will able to check, identify, analyze and repair the wooden job.

The trainee also undergoes two weeks project work at the end of each semester which gives them more practical exposure and helps to build up confidence level.

2. TRAINING SYSTEM

2.1 GENERAL

The Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers a range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under the aegis of National Council of Vocational Training (NCVT). Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) are two pioneer programmes of NCVT for propagating vocational training.

Carpenter trade under CTS is one of the popular courses delivered nationwide through a network of ITIs. The course is of one-year (02 semester) duration. It mainly consists of trade (skills and knowledge). After passing out of the training programme, the trainee is awarded National Trade Certificate (NTC) by NCVT which is recognized worldwide.

Trainee broadly needs to demonstrate that they are able to:

- Read and interpret technical parameters/ documentation, plan and organize work processes, identify necessary materials and tools.
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations.
- Apply professional knowledge & employability skills while performing the job and modification & maintenance work.
- Check the system specification and application software as per requirement of the design of job.
- Document the technical parameter related to the task undertaken.

2.2 CAREER PROGRESSION PATHWAYS

- Can join Apprenticeship programme in different types of industries leading to National Apprenticeship Certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITIs.

2.3 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of one year (02 semesters):

S No.	Course Element	Notional Training Hours
1	Professional Skill (Trade Practical)	1050
2	Professional Knowledge (Trade Theory)	252
3	Workshop Calculation & Science	84
4	Engineering Drawing	126
5	Employability Skills	110
6	Library & Extracurricular activities	58
7	Project Work	160
8	Revision & Examination	240
	Total	**2080**

2.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of course and at the end of the training programme as notified by the Govt. of India from time to time. The employability skills will be tested in first two semesters only.

a) The **Internal Assessment** during the period of training will be done by **Formative Assessment Method** by testing for assessment criteria listed against learning outcomes. The training institute have to maintain individual *trainee portfolio* as detailed in assessment guideline. The marks of internal assessment will be as per the template (Annexure – II).

b) The final assessment will be in the form of summative assessment method. The All India Trade Test for awarding NTC will be conducted by NCVT at the end of each semester as per the guideline of Govt. of India. The pattern and marking structure is being notified by Govt. of India from time to time. **The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check** individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

The minimum pass percentage for Practical is 60% & minimum pass percentage for Theory subjects is 40%. For the purposes of determining the overall result, 50% weightage is applied to the result of each semester examination.

2.4.2 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 should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/wastage as per procedure, behavioral attitude, sensitivity to environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.
Assessment will be evidence based, comprising the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work

Evidences of internal assessments are to be preserved until forthcoming semester examination for audit and verification by examination body. The following marking pattern to be adopted while assessing:

Performance Level	Evidence
(a) Weightage in the range of 60 -75% to be allotted during assessment	
For performance in this grade, the candidate should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices.	• Demonstration of good skill in the use of hand tools, machine tools and workshop equipment. • Below 70% tolerance dimension achieved while undertaking different work 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 75% - 90% to be allotted during assessment	
For this grade, a candidate should produce work which demonstrates attainment of a reasonable standard of craftsmanship, with little guidance, and regard for safety procedures and practices.	• Good skill levels in the use of hand tools, machine tools and workshop equipment. • 70-80% tolerance dimension achieved while undertaking different work 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	
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.	• High skill levels in the use of hand tools, machine tools and workshop equipment. • Above 80% tolerance dimension achieved while undertaking different work 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.

3. JOB ROLE

Brief description of job roles:

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 on 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, scriber 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.

Carpenter, Construction: 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 oversize 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, scriber, 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, 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.

Plan and organize assigned work and detect & resolve issues during execution in his own work area within defined limit. Demonstrate possible solutions and agree tasks within the team. Communicate with required clarity and understand technical English. Sensitive to environment, self-learning and productivity.

Reference NCO-2015:

a) 7115.0100
b) 7115.0200

4. GENERAL INFORMATION

Name of the Trade	**CARPENTER**
NCO - 2015	7115.0100, 7115.0200
NSQF Level	Level-4
Duration of Craftsmen Training	One year (Two semesters each of six months duration)
Entry Qualification	Passed 10th Class Examination under 10+2 System of education or its equivalent.
Unit Strength (No. Of Student)	20 (Max. supernumeraries seats: 6)
Space Norms	Workshop: 120 Sq. m
Power Norms	8 KW
Instructors Qualification for	
1. Carpenter Trade	Degree in Civil/ Mechanical Engineering with one year experience in relevant field. **OR** Diploma in Civil/ Mechanical Engineering with two-year experience in relevant field. **OR** NTC/NAC passed in the Trade of "Carpenter" with three-year post qualification experience in the relevant field. ***Desirable:*** Preference will be given to a candidate with CITS (Craft Instructor Training Scheme) in relevant Trade. ***Out of two Instructors required for the unit of 2 (1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications.***
2. Workshop Calculation & Science	Degree in Engineering with one year experience. **OR** Diploma in Engineering with two-year experience. **Desirable:** Craft Instructor Certificate in RoD&A course under NCVT.

3. Engineering Drawing	Degree in Engineering with one year experience. **OR** Diploma in Engineering with two-year experience. **OR** NTC/ NAC in the Draughtsman (Mechanical / Civil) with three-year experience.
4. Employability Skill	MBA OR BBA with two-year experience OR Graduate in Sociology/ Social Welfare/ Economics with two-year experience OR Graduate/ Diploma with two-year experience and trained in Employability Skills from DGT institutes. **AND** Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above. **OR** **Existing Social Studies Instructors duly trained in Employability Skills from DGT institutes.**
List of Tools and Equipment	As per Annexure – I

Distribution of training on Hourly basis: (Indicative only)

Total Hours/Week	Trade Practical	Trade Theory	Workshop Cal. &Sc.	Engg. Drawing	Employability Skills	Extra-curricular Activity
40 Hours	25 Hours	6 Hours	2 Hours	3 Hours	2 Hours	2 Hours

5. NSQF LEVEL COMPLIANCE

NSQF level for Carpenter trade under CTS: **Level 4**

As per notification issued by Govt. of India dated- 27.12.2013 on National Skill Qualification Framework total 10 (Ten) Levels are defined.

Each level of the NSQF is associated with a set of descriptors made up of five outcome statements, which describe in general terms, the minimum knowledge, skills and attributes that a learner needs to acquire in order to be certified for that level.

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are:

a. Process
b. Professional Knowledge
c. Professional Skill
d. Core Skill
e. Responsibility

The Broad Learning outcome of Carpenter trade under CTS mostly matches with the Level descriptor at Level- 4.

The NSQF level-4 descriptor is given below:

Level	Process Required	Professional Knowledge	Professional Skill	Core Skill	Responsibility
Level 4	Job that requires well developed skill, with clear choice of procedures in familiar context.	Knowledge of facts, principles, processes and general concepts, in a field of work or study.	A range of cognitive and practical skills required to accomplish tasks and solve problem by selecting and applying basic methods, tools, materials and information.	Desired mathematical skill, understanding of social, political and some skill of collecting and organizing information, communication.	Responsibility for own work and learning and some responsibility for other's works and learning.

6. LEARNING/ ASSESSABLE OUTCOME

Learning outcomes are a reflection of total competencies of a trainee and assessment will be carried out as per the assessment criteria.

6.1. GENERIC LEARNINGOUTCOME

The following are minimum broad Common Occupational Skills/ Generic Learning Outcome after completion of the CARPENTER course of 01 year duration:

1. Recognize & comply with safe working practices, environment regulation and housekeeping.
2. Understand and explain different mathematical calculation & science in the field of study including basic electrical. *[Different mathematical calculation & science-Work, Power & Energy, Algebra, Geometry & Mensuration, Trigonometry, Heat & Temperature, elasticity]*
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, Different Projections, Assembly drawing, Sectional views, Estimation of material]*
4. Select and measure dimension of components and record data.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day-to-day work to improve productivity & quality.
6. Explain energy conservation, global warming and pollution and contribute in day-to-day work by optimally using available resources.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day-to-day work for personal & societal growth.
8. Plan and execute the work related to the occupation.

6.2. SPECIFIC LEARNING OUTCOME

Semester – I

9. Identify timber/wood, apply measuring, marking and testing instrument and other holding and supporting hand Tools.
10. Identify and apply various saws and portable power saw machines for Ripping, cross cutting, Oblique sawing and curve cutting etc.
11. Analyze the surface finish with exact sizing by planning, operation, identifying and applying various shaving tools or portable power planning machine.

12. Identify and apply various paring tools, analyze and choose the positioning and employ holding device for chiselling with better finish.
13. Identify and classify various types of joints, analyze and prepare correct joint at correct position, related with strength and appearance.
14. Make small wooden job as per drawing with schedule sizes of timber or alternatives of timber i.e. FRP, MDF, FOAM using various hardware.
15. Analyze and identify various carving tools and convert a wooden block/ piece into a decorative article.
16. Demonstrate preservation of wooden item through surface finishing with various processes such as painting, polishing, varnishing etc.

Semester – II

17. Demonstrate ripping, cross cutting, curve cutting etc. on band saw/ circular saw machine and grinding and setting of blade/ cutter.
18. Demonstrate different operations on planning machine along with sharpening blades. (Range of operations – Surfacing, thickening, chamfering, edge bending etc.)
19. Demonstrate working on pedestal grinding (Range of operations – grinding of mushroom head, cutting edge of tools, drills, etc.)
20. Make holes of different sizes in correct location on wood work.
21. Demonstrate different operations on wood turning lathe along with sharpening of cutting tools.
22. Demonstrate different operations on Tenon and mortise machine.
23. Demonstrate different operations on Sanding machine.
24. Identify and prepare different types of pattern, core box, core print etc. for moulding application with proper allowances and colour codes.
25. Produce component involving different operations of fitting work and check for functionality.
26. Produce component involving different operations of sheet metal work and check for functionality.
27. Prepare various roof truss, door and windows frame and shutters, assembling & fixing (wooden/ aluminium or PVC).
28. Paint various door, windows frame, stair and furniture (wooden or aluminium).
29. Prepare various type of wooden floor, partition wall etc.
30. Check, identify, analyze and repair the wooden job.

7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING/ ASSESSABLE OUTCOME	
LEARNING/ ASSESSABLE OUTCOME	**ASSESSMENT CRITERIA**
1. Recognize & comply with safe working practices, environment regulation and housekeeping.	1. 1. Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements.
	1. 2. Recognize and report all unsafe situations according to site policy.
	1. 3. Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	1. 4. Identify, handle and store/ dispose of dangerous/unsalvageable goods and substances according to site policy and procedures following safety regulations and requirements.
	1. 5. Identify and observe site policies and procedures withregard to illness or accident.
	1. 6. Identify safety alarms accurately.
	1. 7. Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	1. 8. Identify and observe site evacuation procedures according to site policy.
	1. 9. Identify Personal Productive Equipment (PPE) and use the same as per related working environment.
	1. 10. Identify basic first aid and use them under different circumstances.
	1. 11. Identify different fire extinguisher and use the same as per requirement.
	1. 12. Identify environmental pollution & contribute to avoidance of same.
	1. 13. Take opportunities to use energy and materials in an environmentally friendly manner.
	1. 14. Avoid waste and dispose waste as per procedure.
	1. 15. Recognize different components of 5S and apply the same in the working environment.
2. Understand and explain different mathematical	2.1 Explain concept of basic science related to the field such as Material science, Mass, weight, density, heat & temperature,

calculation & science in the field of study including basic electrical. *[Different mathematical calculation & science - Work, Power & Energy, Algebra, Geometry, Mensuration, Trigonometry, Heat & Temperature, elasticity]*	heat treatment.
	2.2 Measure dimensions as per drawing
	2.3 Use scale/ tapes to measure for fitting to specification.
	2.4 Comply with given tolerance.
	2.5 Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.
	2.6 Ensure dimensional accuracy of assembly by using different instruments/gauges.
	2.7 Explain basic electricity, insulation and earthing.
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, Different Projections, Assembly drawing, Sectional views, Estimation of material]*	3. 1. Read and interpret the information on drawings and apply in executing practical work.
	3. 2. Read & analyse the specification to ascertain the material requirement, tools, and assembly/maintenance parameters.
	3. 3. Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/ parameters to carry out the work.
4. Select and measure dimension of components and record data.	4.1 Select appropriate measuring scale/tape/gauges.
	4.2 Measure dimension of the components/assembly & compare with given drawing/measurement.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day-to-day work to improve productivity & quality.	5.1 Explain the concept of productivity and quality tools and apply during execution of job.
	5.2 Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.
	5.3 Knows benefits guaranteed under various acts.

6. Explain energy conservation, global warming and pollution and contribute in day-to-day work by optimally using available resources.	6.1 Explain the concept of energy conservation, global warming, pollution and utilize the available recourses optimally & remain sensitive to avoid environment pollution.
	6.2 Dispose waste following standard procedure.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day-to-day work for personal & societal growth.	7. 1. Explain personnel finance and entrepreneurship.
	7. 2. Explain role of various schemes and institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financing support agencies to familiarize with the Policies/Programmes & procedure & the available scheme.
	7. 3. Prepare Project report to become an entrepreneur for submission to financial institutions.
8. Plan and execute the work related to the occupation.	8. 1. Use documents, drawings and recognize hazards in the work site.
	8. 2. Plan workplace/ assembly location with due consideration to operational stipulation.
	8. 3. Communicate effectively with others and plan project tasks.
	8. 4. Execute the task effectively.

SPECIFIC LEARNING/ ASSESSABLE OUTCOMES	
SEMESTER-I	
LEARNING/ ASSESSABLE OUTCOMES	**ASSESSMENT CRITERIA**
9. Identify timber/ wood & apply measuring, marking and testing instrument and holding & supporting hand Tools.	9. 1 Demonstrate workshop safety & discipline.
	9. 2 Identify different types of wood/ timber.
	9. 3 Identify the measuring, marking, work holding and testing instrument.
	9. 4 Mark as per drawing and measure dimensions for checking.
	9. 5 Demonstrate use of testing instrument and other useable hand tools.
10. Identify and apply various saws and portable power saw machines for Ripping, cross cutting, Oblique sawing and curve cutting etc.	10.1 Select material and inspect visually for defects.
	10.2 Mark the job as per drawing and check measurements before sawing.
	10.3 Mark an angle with the aid of bevel square and mitre square for oblique sawing.
	10.4 Identify and arrange the required tools for desired operations and make the job.
	10.5 Perform Ripping/cross, cutting/curve, sawing/ cutting operations according to the marking following safety norms.
	10.6 Check for dimensional accuracy.
	10.7 Avoid waste and plan for reuse/ dispose of the unused items.
11. Analyze the surface finish with exact sizing by planning operation identify and apply various shaving tools or portable power planning machine.	11. 1 Select material and appropriate planner for required surface finish and size.
	11. 2 Set planner with sharpened cutting iron and perform required planning operation to obtain required size and finish.
	11. 3 Plane across the grain and end grain.
	11. 4 Check the size, flatness, squareness and finish of the job as per drawing.
	11. 5 Demonstrate removal, sharpening and fitting of planner blade observing standard operating procedures.
12. Identify and apply various paring tools and analyze and choose the positioning	12. 1 Arrange woods with vertical/ horizontal grains and required type of chisel for performing operation (chiselling across the grain)as per drawing.

and employ holding device for chiselling with better finish.	12. 2 Mark the work as per dimension of the drawing.
	12. 3 Perform chiselling as per drawing and ensure better finish.
	12. 4 Check the finished job as per drawing.
13. Identify and classify various types of joints, analyze and prepare correct joint at correct position, related with strength and appearance.	13. 1 Choose exact type of joint to employ and arrange materials, tools and equipments to perform the operation.
	13. 2 Perform framing joint (Sawing and chiselling) as required maintaining dimensions.
	13. 3 Assemble different parts and check for correctness, strength and finishing.
14. Make small wooden job as per drawing with schedule sizes of timber or alternatives of timber i.e. FRP, MDF, FOAM using various hardware.	14. 1 Arrange required material, tools etc. to make the job as per drawing.
	14. 2 Mark as per drawing.
	14. 3 Perform sawing, chiselling of different parts, prepare all the parts as per marking layout and check dimension.
	14. 4 Assemble different parts to make a complete job.
	14. 5 Overall finish and check dimensions as per drawing.
	14. 6 Avoid waste and plan for reuse/ dispose of the unused materials.
15. Analyze and identify various carving tools and convert a wooden block/ piece into a decorative article.	15. 1 Plan for wood carving as per drawing and arrange for material and tools for the purpose.
	15. 2 Mark layout as per drawing.
	15. 3 Perform wood carving operation to make a piece of wood as per drawing.
	15. 4 Check for corrections as per drawing.
	15. 5 Finish the product by smoothing.
16. Demonstrate preservation of wooden item through surface finishing with various processes such as painting, polishing, varnishing etc.	16. 1 Plan for finish the surface of wooden product as per requirement and arrange required items and tools.
	16. 2 Clean/ prepare surface for the purpose.
	16. 3 Smoothen surface applying proper procedure.
	16. 4 Apply varnish/ polish on the surface to get required finish.
	16. 5 Check the quality of finish.

SEMESTER-II	
17. Demonstrate ripping, cross cutting, curve cutting etc. on band saw/ circular saw machine and grinding and setting of blade/ cutter.	17.1 Plan and select the job and set up machine accessories at position to perform desired operation.
	17.2 Check the saw or blade and cutter guard.
	17.3 Set the job and perform desired operation with proper adjustment of table, guide, fence and blade guard.
	17.4 Check the product shape, size and dimensions with the drawing.
	17.5 Sharpen cutter or saw teeth and set teeth of saw.
18. Demonstrate different operations on Jointer/ surface Planer/ Thickness planer machine along with sharpening blades. (Range of operations – Surfacing, thickening, chamfering, edge bending etc.)	18. 1 Plan and set the job and machine for surfacing and thickening operation.
	18. 2 Adjust the table, fence and blade guard as per the width and thickness of the job.
	18. 3 Perform desired operation and check the correctness as per drawing.
19. Demonstrate working on pedestal grinding (Range of operations – grinding of mushroom head, cutting edge of tools, drills, etc.)	19. 1 Plan for offhand grinding with required safety norms.
	19. 2 Perform grinding operation to make required shape, size and dimension.
	19. 3 Check the work for its dimensional accuracy and cutting efficiency.
20. Demonstrate working on pedestal/potable drilling machine, use of different types of drill bits; make holes of different sizes in correct location on wood work.	20. 1 Plan and select material and machine for drill holes to make observing safety points.
	20. 2 Mark the job as per drawing.
	20. 3 Set the job and cutting tool properly.
	20. 4 Perform operation to make drill holes as per drawing.
	20. 5 Check dimensions for correctness.

21. Demonstrate different operations on wood turning lathe along with sharpening of cutting tools.	21. 1 Plan and set the machine for desired turning operation.
	21. 2 Hold the job between centres or in other work holding devices.
	21. 3 Hold the tool and adjust tool rest
	21. 4 Perform required turning operation observing standard operating procedure.
	21. 5 Check dimensions and finish as per drawing.
22. Demonstrate different operations on Tenon and mortise machine.	22. 1 Plan and set the Mortise machine for mortising operation and check sharpness of the tool.
	22. 2 Mark the mortise on the job, select and set the chisel on the machine.
	22. 3 Hold the job and adjust the table as per the depth and bench of mortise.
	22. 4 Make the mortise to the required size and check the job for correctness.
	22. 5 Plan and set the Tenoning machine for tenoning operation.
	22. 6 Mark the tenon on the job for tenon cutting.
	22. 7 Set the job on the tenoning machine and cut the hunched portion.
	22. 8 Check the job for correctness.
23. Demonstrate different operations on Sanding machine.	23. 1 Plan to perform and set the sanding machine for sanding operation.
	23. 2 Perform sanding operation.
	23. 3 Check the job for correctness.
24. Identify and prepare	24. 1 Study the drawing and make a plan for making desired pattern.

different types of pattern, core box, core print etc. for moulding application with proper allowances and colour codes.	24. 2 Select proper material and tool for making the pattern.
	24. 3 Prepare layout for the pattern.
	24. 4 Make the material as per layout considering contraction scale, drafting and machining allowances and check the dimensions.
	24. 5 Perform removing material and make the pattern as per drawing.
	24. 6 Check for accuracy of the pattern.
25. Produce component involving different operations of fitting work and check for functionality.	25. 1 Study the drawing/ sketch and plan for the required steps of operation to produce the item.
	25. 2 Arrange required materials, tools and machineries for smooth performance of the operations.
	25. 3 Mark the job as per drawing.
	25. 4 Perform required operation to prepare the job as per drawing.
	25. 5 Check the dimensions of the product and its functionality.
26. Produce component involving different operations of sheet metal work and check for functionality.	26. 1 Study the drawing/ sketch and plan for the required steps of operation to produce the item.
	26. 2 Arrange required materials, tools and machineries for smooth performance of the operations.
	26. 3 Develop and mark metal sheet to make the desired component as per drawing.
	26. 4 Perform required operations to prepare the job as per drawing.
	26. 5 Check the dimensions of the product and its functionality.
27. Prepare various roof truss, door and windows frame and shutters, assembling &	27. 1 Study the drawing/ sketch and plan for the required steps of operation to produce the item.
	27. 2 Arrange required materials, tools and machineries for

	fixing (wooden/ aluminium or PVC).	smooth performance of the operations.
		27. 3 Mark the job and perform required operation to prepare the item as per drawing.
		27. 4 Assemble the components to make a complete item.
		27. 5 Check the dimensions of the product and its functionality.
28.	Paint various door, windows frame, stair and furniture (wooden or aluminium).	28. 1 Plan and arrange materials and tools for painting wooden surface.
		28. 2 Remove old paint and/ or clean, smoothen and prepare the surface to be painted.
		28. 3 Prepare correct solution of primer/ paint.
		28. 4 Apply primer/ paint on the surface with correct procedure.
		28. 5 Check finishing of the work.
29.	Prepare various type of wooden floor, partition wall etc.	29. 1 Study the drawing/ sketch and plan for the required steps of operation to produce the item.
		29. 2 Arrange required materials, tools and machineries for smooth performance of the operations.
		29. 3 Mark the job and perform required operation to prepare the item as per drawing.
		29. 4 Assemble the components to make a complete item.
		29. 5 Check the dimensions of the product and its functionality.
30.	Check, identify, analyze and repair the wooden job.	30. 1 Check the wooden/ Aluminium/PVC or like item and identify the repair/ reconditioning work to be done.
		30. 2 Plan for the repair/ reconditioning work and arrange required materials, tools and machineries for smooth

		performance of the work.
	30. 3	Perform the repair/ reconditioning work.
	30. 4	Check the item for its workability/ acceptability.

8. SYLLABUS

SYLLABUS FOR CARPENTER TRADE			
FIRST SEMESTER - 6 MONTHS			
Week No.	**Learning Outcome**	**Professional Skills (Trade Practical) With Indicative Hours**	**Professional Knowledge (Trade Theory)**
1	Identify timber/ wood, apply measuring, marking and testing instrument and holding & supporting hand Tools.	1. Demonstrate first aid, fire safety equipment, different types of fire extinguisher and their application. (10hrs) 2. Identification of different wooden sample piece i.e.- soft wood & hard wood, wooden grains etc. & their applications.(04hrs) 3. Identification of wooden sample piece (Annual ring, knots, shakes & chicks etc.). (03hrs) 4. Demonstrate use of hand operated tools and showing different audio-visual clips.(08 hrs)	• Introduction of carpentry trade. • General discipline, workshop discipline & Housekeeping. • Safety precaution in the workshop and industrial safety. • Importance of P.P.E, Types of PPE and their application. • Introduction of timber, growth of timber trees, cross-section of exogenous tree trunk, types of tree, different part of a tree, Soft & hard wood, their differences.
2	-do-	5. Identification and use of different types of the measuring, marking and testing tools & their applications. (10hrs) 6. Identification and use of different types of work holding devices. (06hrs) 7. Demonstrate use of machinery and hand operated portable tools and their safety.(09 hrs)	• Common Indian timbers • Defects in timber, diseases of timber, knots, shakes, grains etc. • Introduction of carpentry hand tools, classification and uses of marking, work holding devices • Measuring,& testing tools.

3	Identify and apply various saws and portable power saw machines for Ripping, cross cutting, Oblique sawing and curve cutting etc.	8. Demonstrate the use of bench vice, bench hook, bench stop& their application. (02 hrs) 9. Demonstrate different types of saws- ripping, cross cutting, curve cutting, oblique sawing. (06 hrs) 10. Use and practice Portable power circular saw. (04hrs) 11. Sharpen and set different type saw blade. (05 hrs) 12. Demonstrate the use of country drill, hand drill, ratchet brace, Breast drill and hand augers & bits. (04hrs) 13. Demonstrate the use of portable electrical drill machine.(02hrs) 14. Demonstrate the Auger application. (02hrs)	• Type of bench vice and their uses. • Introduction of different saw and their uses. • Introduction of power circular saw and its use. • Type of special saw and its uses i.e. -compass saw, coping saw, bow saw, fret saw. • Saw sharpening and sharpening tools. • Description of boring tools - Types, Parts, functions, size and application. • Description of portable electrical drill machine. • Drill bits, types, sizes etc. • Hand augers description, sizes of augers, application of hand augers.
4	Analyze the surface finish with exact sizing by planning operation, identifying and applying various shaving tools or portable power planning machine.	15. Planning face, face edge. (04 hrs) 16. Demonstrate the use of marking, mortise gauge etc. (04 hrs) 17. Test the accuracy of flatness and twistness of the surface by using try square. (04hrs) 18. Demonstrate the use of winding strips, cross planning, edge planning. (04hrs) 19. Grinding and Sharpening process of the planer blade/ cutter. (05 hrs) 20. Demonstration of portable power planer machine and its function. (04 hrs)	• Type of different planes and their proper uses in wood work - Description, function and its size, setting, knowledge of sharpening and uses etc. • Knowledge of using marking gauges. • Important instruments necessary for checking flatness and twistness of surface. • Sharpening and grinding angle of cutter. • Portable power planer - useful in modern wood work and new technology

			design.
5	Identify and apply various paring tools and analyze and choose the positioning and employ holding device for chiselling with better finish.	21. Demonstrate the use of different types of chisel, chiselling, chiselling along& across the grain. (08hrs) 22. Grind/ sharpen and honing of a chisel. (08hrs) 23. Demonstrate use of different types of striking tool, hammer and mallets.(04hrs) 24. Demonstrate the use of clamps 'G' or 'C', saw sharpening vice, carpentry vice etc. (05hrs)	• Different type chisels - Definition, identification, their uses. • Necessity of grinding and sharpening. • Striking tools- Definition, types, application. • Files - Types, uses • Care & maintenance of files • Function of work bench, bench vice, bench hook , etc.
6	Identify and classify various types of joints, analyze and prepare correct joint at correct position, related with strength and appearance.	**Demonstration and making framing joint** 25. Single Mortise and tenon Joint. (04 hrs) 26. Double tenon & mortise joint. (04 hrs) 27. Plain hunched tenon and mortise joint. (04 hrs) 28. Mitre corner tenon & mortise joint. (04 hrs) 29. Task tenon mortise joint. (04 hrs) 30. Bare faced tenon joint. (05 hrs)	• Seasoning of timber - Definition, advantage and disadvantage of seasoning. • Moisture content in timber and its effect on timber. • Characteristics of wood, physical and mechanical properties of wood. • Quality of good timber. • Define the classification of wooden joint. • Description of different types joint. • Uses of joint: Framing joint angle joint and lengthening joint etc.
7	-do-	**Demonstration and making Housing joints** 31. Full housing joint. (08 hrs) 32. Bridle joint etc. (04 hrs) 33. Stopped housing joint.(08 hrs) 34. Dovetail housing joint. (05 hrs)	• Preservation of timber. • Application of different types of preservation & Process of each treatment. • Definition of housing joint. • Different type of housing joint. • Uses of housing joint.

8	-do-	**Demonstration and making dovetail joint** 35. Single dovetail joint. (06 hrs) 36. Common dovetail joint.(06 hrs) 37. Lapped dovetail joint. (06 hrs) 38. Secret mitre dovetail joint uses of dovetail template. (07 hrs)	• Description of different dovetail joint and their function. • Uses of dovetail joint. • Glues - Types of glue and their uses.
9	-do-	**Demonstration and Making broadening joints** 39. Simple butt joint by hard wood (100 mm width and 15mm thick). (02 hrs) 40. Riveted butt joint on hard wood (100mm width and 25mm thick). (04 hrs) 41. Pocket screw butt joint on hard wood (100mm width and 15mm thick). (03 hrs) 42. Secret pocket screw butt joint on teak wood or hard wood (100mm width and 100mm thick). (06 hrs) 43. Glued butt joint with dowel by a hard wood (100mm width and 15mm thick). (04 hrs) 44. Tongue and groove joint on hard wood (100mm width and 15mm thick). (06 hrs)	• Broadening joint description. • Types of broadening joint. • Application of broadening joint. • Setting of end side according to annual Rings as well as matching the grain stranding. • Advantage of adhesives use and their types. • Method of Dowel application.
10	-do-	**Making lengthening joint** 45. End half lap joint on hard wood (50mm X 50mm). (02 hrs) 46. End over lap joint by hard wood 150mm X 25mm. (01 hr) 47. End bends lap joint on hard	• Lengthening joint description. • Types of lengthening joint. • Application of different lengthening joint. • Setting of two tapper wedges. • Advantages of table & scarf

		wood (50mm X25mm). (02 hrs) 48. Table scrat joint on hard wood (50mm X 50m). (06 hrs) 49. Too then end table & scarf joint on hard wood (50mm X 50m). (08 hrs) 50. Bend scarf joint on teak wood or hard wood (50mm X 50m). (06 hrs)	joint.
11	-do-	**Making of Frame using different type of joints –** 51. Stopped Tenon & mortise Joint on hard wood to make tea table frame to lock four legs, top rail and bottom rails. (12 hrs) 52. Lapped half lap dovetail joint on bottom rails on hard wood. (03 hrs) 53. Tongue & Groove joint on table top by hard wood as a broadening joint. (10 hrs)	• Veneer, Plywood • Types of plywood • Advantage of plywood • Application of plywood, block board, laminated board, hard board, insulation board, mica etc.
12	Make small wooden job as per drawing with schedule sizes of timber or alternatives of timber i.e. FRP, MDF, FOAM using various hardware.	**Make small wall bracket –** 54. Make joint on hard wood to make small frame. (08 hrs) 55. Stopped Tenon & Mortise joint on hard wood in the frame to set the selves. (04 hrs) 56. Make selves by six pieces of hard wood with single lapped half lap dovetail joint with frame (two nos. of selves). (13 hrs)	• Parts & terms of portable disc sander. • Application of portable disc sander. • Care & maintenance of disc sander.
13	-do-	57. Four sides of chalk box. (100mm X 120mm X 100mm) locked with hard wood by	• Method of making a wooden partition • Door frames

		common dovetail joint (3 pin). (09 hrs) 58. Grooves on three sides. (02 hrs) 59. Make the lid & base with masonite with handle leveled with top. (02 hrs) 60. Common dovetail joint apply to lock four sides of tray (400mm X 300mm X 200mm). (09 hrs) 61. Bases made with ply wood (5mm thick) and make the handle. (03 hrs)	• Door & window panels
14	-do-	62. Layout of stool and make cutting List for mass production. (08 hrs) 63. Prepare standard height tapper legged stool as per layout. (15 hrs) 64. Demonstrate application of adhesive. (02 hrs)	• Calculation of timber required for stool. • List out the sequence of operation of the job.
15	-do-	65. Layout making for notice board or display board by hard board, ply wood and insulation board. (12 hrs) 66. Making a small rack by layout with hard wood and ply wood. (13 hrs)	• Timbers used in furniture work – describe Sal, teak, gamar, pine, deoder etc. • Properties and characteristics of different furniture wood.
16	-do-	67. Make Frame structure with the block board, layout as per the size and cutting by portable circular saw machine with Common dovetail joint used in the structure. (12 hrs) 68. Painting and polishing or fixing sunmica with adhesive. (08 hrs)	• Conversion and types of conversion. • Parallel sawing Radial sawing Quarter sawing Tangential sawing Process and advantage • Design of wooden wall unit uses in bed rood, dining hall,

		69. Setting glasses and hard works as on required location. (05 hrs)	library, office, workshop classroom.
17	-do-	70. Make a small table use of lock, hinges, hasp and staple etc. making a small box with sunmica top. (Mortise and tenon joint. 'T' half tap dovetail joint. Secret dovetail joint). (20 hrs) 71. Uses sunmica and pest on the top of table. (05 hrs)	• Uses of joint for small table to stranger strength. • Manufacturing process of various boards and sheets. • Types of hinges, Uses of hinges • Types of door lock & their different uses.
18	-do-	**Demonstration on nailing screwing on job** 72. Use selected nail for the table and small box. (12 hrs) 73. Use selected screw for the table and small box. (08 hrs) 74. Application of different types of Nails, screws etc.(05 hrs)	Nails and screws – • Nail and screws – types, Uses etc. • Nut, bolts and washer - types and Uses • Lock hinges hasp and staple. • Knowledge of other fittings – types, sizes and lenses.
19	Analyze and identify various carving tools and convert a wooden block/ piece into a decorative article.	75. Demonstrate wood carving using carving tools, sharpen carving tools and finish by smoothing. (25 hrs)	• Description of different carving tools. • Tools required for ornamental carving. • Properties of wood. • Preparation a bill of materials. • Estimate the material.

20	Demonstrate preservation of wooden item through surface finishing with various processes such as Painting, polishing & varnishing etc.	76. Prepare surface for Painting. (04 hrs) 77. Apply paints. (03hrs) **Varnish surface of wood work –** 78. Prepare surface for varnishing by smoothing plane. (04 hrs) 79. Smoothing plane on knotty and interlocked cross grained.(04hrs) 80. Smoothen surface by scraping with sand paper or portable sander machine.(06 hrs) 81. Varnish on finished surface.(04hrs)	• Paints, ingredients of paints. • Name of the agent of paints. • Method of preparation of surface for staining. • Necessary tools and equipment required for staining. • Uses of different grade sand paper. • Portable sander machine - uses • Preparation of putty and use. • Staining – type, process, methods applied for different timber.
21	-do-	**Polishing of Furniture –** 82. Cleaning of furniture surface.(04hrs) 83. Application of French polish. (06hrs) 84. Application of wax polishes.(06hrs) 85. Remove old polish and re-polish old furniture. (05hrs) 86. Prepare an estimation of wooden furniture. (04hrs)	• Description & method of French polish. • Method of wax polish and its uses. • Methods of old furniture re-polish. • Estimation process of wooden furniture.
22-23	Project Work/ Industrial Visit- a) Key Box b) Tea coaster c) Cash Box d) First aid Box e) Stool f) Table		
24-25	**Revision**		
26	**Examination**		

Note: *More emphasis to be given on video/real-life pictures during theoretical classes. Some real-life pictures/videos on the skills/ topics taught in this semester may be shown to the trainees to give a feel of Industry and their future assignment.*

SYLLABUS FOR CARPENTER TRADE			
SECOND SEMESTER – 06 Months			
Week No.	**Learning Outcome Reference**	**Professional Skills (Trade Practical) With Indicative Hours**	**Professional Knowledge (Trade Theory)**
27	Demonstrate ripping, cross cutting, curve cutting etc. on band saw/ circular saw machine and grinding and setting of blade/ cutter.	87. Demonstrate band saw machine with different parts & their functions. (07 hrs) 88. Demonstration to the safety precaution with operational techniques. (07 hrs) 89. Remove and refit band saw blades. (03 hrs) 90. Grinding and setting operation of band saw blade. (08 hrs)	• Describe constructional features of band saw machine. • Types of band saw machine. • Sizes of band saw machine. • Parts of band saw machine. • Function of band saw machine. • P.P.E for band saw machine
28	-do-	91. Ripping & cross cutting operation on band saw machine with hard wood. (07 hrs) 92. Curve cutting operation on hard board or soft wood or ply board by band saw machine. (08 hrs) 93. Bevelling operation on hard wood/ soft wood. (05 hrs) 94. Chamfering operation on hard wood/ soft wood/ ply board by bend saw machine. (05 hrs)	• Operation of band saw machine. • Safety precaution of bad saw machine. • Care & maintenance of band saw machine with oiling & greasing.
29	-do-	95. Demonstrate circular saw machine, its parts and their operational techniques with safety precaution. (04 hrs) 96. Remove and refit of circular saw blade. (02 hrs) 97. Grinding and setting	• Describe circular saw machine. • Types of circular saw machine. • Sizes of circular saw machine. • Identify the parts of circular

		operation of the circular saw blade. (04 hrs) 98. Ripping & cross cutting operation on hard wood/ soft wood/ ply wood (not less than 12 mm) by circular saw machine. (04 hrs) 99. Rebating & grooving operation on hard wood/ soft wood by circular saw machine. (04 hrs) 100. Mitering operation on hard wood/ soft wood/ ply wood (not less than 12 mm) (02 hrs) 101. Demonstrate portable Circular saw machine with different parts & their functions. (04 hrs) 102. Remove and refit of saw blade. (01 hrs)	saw machine. • Function of circular saw machine. • Different types of saw blades used in circular saw machine. • Safety precaution of circular saw machine. • Care & maintenance of circular saw machine with oiling & greasing. • Operation of portable type circular saw machine. • Safety precautions • P.P.E for the circular saw machine
30	• Demonstrate different operations on Jointer/surface Planer/Thickness planer machine along with sharpening blades. (Range of operations – Surfacing, thickening, chamfering, edge bending etc.)	103. Demonstrate Jointer/surface Planer machine, its parts and their operational techniques and safety precaution. (06 hrs) 104. Remove and refit of cutter of planning machine. (04 hrs) 105. Sharpening and honing operation of cutter of planning machine. (15 hrs)	• Describe of planning machine. • Types of planning machine. • Sizes of planning machine. • Parts of surface/thickness planning machine. • Function of surface/ thickness planning machine. • P.P.E for the surface/ thickness planning machine.
31	-do-	106. Surfacing operation on hard wood/ soft wood by planning machine. (06 hrs) 107. Thickness operation on hard wood/ soft wood by planning machine. (06 hrs)	• Operation of surface / thickness planning machine. • Safety precaution of surface / thickness planning machine. • Care & maintenance of

		108. Chamfering Operation (06hrs) 109. Edge bending operation on hard wood/ soft wood by planning machine. (07 hrs)	surface / thickness planning machine • Oiling & greasing.
32	Demonstrate working on pedestal grinding (Range of operations – grinding of mushroom head, cutting edge of tools, drills, etc.)	110. Demonstrate pedestal grinding machine, its parts and their operational techniques with safety precautions. (06 hrs) 111. Demonstrate off hand grinding operation as per requirement of the trade. (07 hrs) 112. Grind mushroom head, cutting edge of tools, drill bits and check correctness. (12 hrs)	• Pedestal grinding machine - Description, Types, Sizes, Parts, Function, Operation of pedestal grinding machine. • Safety precaution and P.P.E for the pedestal grinding machine • Care & maintenance of pedestal grinding machine with oiling &greasing .
33	Demonstrate working on pedestal /potable drilling machine, use of different types of drill bits, make holes of different sizes in correct location on wood work.	113. Demonstrate pedestal drilling machine and its parts & their operational techniques and safety precaution. (06 hrs) 114. Make different sizes of drill hole on wooden block/ job using straight/ taper shank drill bit. (10 hrs) 115. Use of counter sinking bit on job. (07 hrs) 116. Demonstrate care & maintenance. (02 hrs)	• Pedestal drilling machine - Description, Types, Sizes, Parts, Function, Operation of pedestal drilling machine. • Safety precaution and P.P.E for the pedestal drilling machine • Care & maintenance of pedestal drilling machine with oiling & greasing • Types of drill bits used in drill machine.

34	Demonstrate different operations on wood turning lathe along with sharpening of cutting tools.	117. Demonstrate wood turning lathe, its parts & chisels sets with operational technique and safety precaution. (04 hrs) 118. Remove, grind and refit cutting tools and set job. (04 hrs) 119. Plain turning operation on hard wood/ soft wood by wood turning lathe. (04 hrs) 120. Drilling, boring, taper turning operation on hard wood/ soft wood by wood turning lathe. (05 hrs) 121. Make chisel handle, table lamp stand, etc on wood turning lathe. (05 hrs) 122. Internal turning operation using face plate. (03 hrs)	• Wood turning lathe – Description, Types, Sizes, Parts, Function, Types, Operation of wood turning lathe. • Safety precaution and P.P.E for wood turning lathe. • Care & maintenance of wood turning lathe with oiling & greasing. • Types and application of set of chisels • Signature of cutting tools.
35	Demonstrate different operations on Tenon and mortise machine.	123. Demonstrate working of mortise machine, its part, their operational techniques and safety precaution. (06 hrs) 124. Adjust table along with feed and job holding. (03 hrs) 125. Mortising operation on hard wood/ soft wood (300mmX50 mm X 25mm). (05 hrs) 126. Remove and refit of chain & sprocket with the machine. (05 hrs) 127. Make groove at the face or edge on the job. (06 hrs)	• Mortise machine – Description, Types, Sizes, Parts, Function, Operation of mortise machine. • Safety precaution and P.P.E for mortise machine. • Care & maintenance of mortise machine with oiling & greasing • Calculation of timber, weight, area, volume etc.
36	Demonstrate different operations on Sanding	128. Demonstrate working of different types Sanding machine, its part, their	• Sanding machine – Description, Types, Parts of sanding machine.

	machine	operational techniques and working safety precaution. (10 hrs) 129. Operation on hard wood/ soft wood by using sanding machine. (15 hrs)	• Safety precaution and P.P.E for sanding machine.
37	Identify and prepare different types of pattern, core box, core print etc. for moulding application with proper allowances and colour codes.	130. Identify pattern making hand tools (02 hrs) 131. Use contraction rule (01 hrs) 132. Demonstrate application of different type of pattern allowances (05 hrs) 133. Layout simple solid pattern on layout board. (03 hrs) 134. Make pattern as per checked layout (take help of wood working machines as much as possible) on teak wood. (06 hrs) 135. Make Layout of split pattern. (03 hrs) 136. Mark and make split pattern on teak wood. (05 hrs)	• Introduction of pattern • Different hand tool including contraction rule. • Different allocation • Different shrinkage • Drafting • Pattern allowance • Different types of timber used in pattern making. • Types of pattern and their uses. • Application of colour code in pattern making.
38	-do-	137. Making dowels for split pattern. (02 hrs) 138. Use of dowel pin and nail and screw etc. (02 hrs) 139. Make templates by sunmica, hard wood. (04 hrs) 140. Make filets.(03 hrs) 141. Layout of multi pieces pattern. (07 hrs) 142. Mark and make multi piece pattern with teak wood as per layout and drawing. (07 hrs)	• Reading of blue print and drawing • Layout board and its use. • Dowel types, size and use in pattern making work. • Multi-piece pattern complication and remedy.
39	-do-	143. Mark and make core and core print. (06 hrs) 144. Prepare core box. (06 hrs.)	• Types and uses of core and core print. • Colour codes specification.

		145. Carting pattern. (05 hrs) 146. Positioning of core point (03 hrs) 147. Apply Colour code on pattern, core box as per IS specification. (05 hrs)	• Use of points on pattern, core, core box are point. • Estimate volume of wood and other requirement for pattern making box.
40	Produce component involving different operations of fitting work and check for functionality.	148. Mark and make hanging plate, corner plate, name plate, different types of clamps and angle plate by chipping, sawing filling, drilling, counter sinking etc. (14 hrs) 149. Make nuts, bolts, washers, screws by drilling, taping and dieing. (06hrs) 150. Grind chisels, drills and check for correct cutting angle. (05hrs)	**General safety in fitting shop** • Types of marking and cutting tools and their uses. (viz., marking block, chisels, hammer, hacksaw, files, etc.) • uses and maintenance of tools – Steel rule, try squares, scriber, divider, calipers and other tools. Marking table, marking block etc. • Application of bench vice, clamps. • Types of drill bits, counter boring tool, taps and dies used in fitting work. • Types of nuts, bolts, washers, machine screws etc.
41-42	Produce component involving different operations of sheet metal work and check for functionality.	**Sheet metal work (S.M.W)** 151. Mark, cut and make various joints. (06hrs) 152. Develop and mark metal sheet to make simple square container as per drawing. (08hrs) 153. Make simple square container with wired edge and riveted joint and check dimension of the product. (12hrs)	**Common sheet metal tools –** • Description, type and uses of hand tools for sheet metal work . • Application of various types of hammer. • Application of various types of stakes. • Development of various type of shape. • Development of drawing

		154. Develop and mark metal sheet to make a funnel as per drawing. (10hrs) 155. Make funnel as per drawing with solder joint and check dimension of the product. (14hrs)	and layout simple pattern • Right concept of shearing, punching, folding, bending etc
43	Prepare various roof truss, door and windows frame, shutters, assembling & fixing (wooden, aluminium & pvc).	156. Revision of basic joint related with building work.(04 hrs) 157. Making door shutter. (06 hrs) 158. Making panel door. (06 hrs) 159. Making door glazed shutter. (06 hrs) 160. Fitting moulding with glass. (03 hrs)	• Introduction about building construction. • Different type door & windows and different size. • Different type panel used for panel shutter, glazed shutter. • Substitute of wood viz., block board, hard board etc.
44	-do-	161. Marking and making window frame and window shutter. (06 hrs) 162. Use protection bar. (05 hrs) 163. Roof trusses layout. (06 hrs) 164. Make Model type king post and queen post. (08 hrs)	• Description of window frame and shutter • Uses of frame and shutter of window • Definition of roof trusses • Terms of king post and queen post.
45	-do-	**Prepare sliding window & 'Z' battend window by aluminum channel** 165. Angular cutting of aluminium bar at different angle and size. (06 hrs) 166. Join angular aluminium bar by screw and modern adhesive like dendrite, feviquick etc. (06 hrs) 167. Aluminium channel bar joining by fibre glass (06 hrs) 168. Fiber glass shutter fitted with	• Description of aluminium • Anodising of the aluminium windows, channel, section etc. • Knowledge of different aluminium section, channels required for manufacturing the windows. • Drilling of aluminium bar and joining by screw and adhesive. • Knowledge of fibre glass • Introduce about rubber

		aluminium channel. (07 hrs)	padding /gasket and aluminium wheel. • Uses of channel window which is involved in building construction.
46	-do-	169. Assembling and fixing of P.V.C door for kitchen and W.C bath. (25 hrs) • Cutting angular wise P.V.C door frame. • Forming shape by joining adhesive and screwing. • P.V.C shutter door finish by adhesive and screwing. • Assembling & fixing the PVC door	• Uses of P.V.C as substitute of wood. • Give more get-up and cheapest in price. • New style framing work. • Modern technologies follow up P.V.C moulding. • Advantages and disadvantages
47	Paint various door, windows frame, stair and furniture (wooden or aluminum).	170. Removal of old painting by application of chemical paint remover. (04 hrs) 171. New painting for door, window stair, furniture, etc. (04 hrs) 172. Plain and smoothing of door & window and staircase railing. (05 hrs) 173. Apply Synthetic enamel primer on the new surface. (08 hrs) 174. Apply synthetic enamel paint or oil paint on the priming surface as finishing coat. (04 hrs)	• Apply of removing old painting by new chemical then after repainting on furniture • Uses of new painting and priming on furniture.
48	Prepare various type of wooden floor, partition wall etc.	175. Identification of simple floor construction. (03 hrs) 176. Use the cogged joint for wooden floors. (04 hrs) 177. Demonstrate different type	• Purpose of using floor construction with different types of joist. • Basic principal of repairing work, door window,

	Check, identify, analyze and repair the wooden job.	basement floor single joint wooden floor and double joint wooden floor. (06 hrs) 178. Make structure of wooden partition wall. (05 hrs) 179. Repair and recondition furniture, door and window, staircase hand railing. (07 hrs)	staircase rack etc. • Illustrate of nail screw bracket angle plate nut bolt, etc. • Economical factors and material estimates. • Hilti laser tools, types and their applications
49-50	**In-plant training** / Project work **Projects viz.** a. Pen stand, b. Flower vase, c. Drawing Board, d. Notice Board e. Doors, f. Windows, etc.		
51	**Revision**		
52	**Examination**		

Abbreviations:

UPVC = Ultra Poly Vinyl Carbon
PVC = Poly Vinyl Carbon
FRP = Fiber reinforced plastic
MDF = Medium Density Fireboard
WC = Water Closet
ACP = Aluminum composite panel
PPE = Personal protective equipment

Note: -

1. *Some of the sample project works (indicative only) are given against each semester.*
2. *Instructor may design their own project and also inputs from local industry may be taken for designing such new project.*
3. *The project should broadly cover maximum skills in the particular trade and must involve some problem solving skill. Emphasis should be on Teamwork: Knowing the power of synergy/ collaboration, work to be assigned to a group (Group of at least 4 trainees). The group should demonstrate Planning, Execution, Contribution and Application of Learning. They need to submit a project report.*

4. *If the instructor feels that for execution of specific project more time is required than he may plan accordingly to produce components/ sub-assemblies in appropriate time i.e., may be in the previous semester or during execution of normal trade practical.*
5. *More emphasis to be given on video/real-life pictures during theoretical classes. Some real-life pictures / videos on the skills / topics taught in this semester may be shown to the trainees to give a feel of Industry and their future assignment.*

9.1 WORKSHOP CALCULATION SCIENCE & ENGINEERING DRAWING

First Semester **Duration: Six Months**		
S No.	**Workshop Calculation and Science**	**Engineering Drawing**
1.	**Unit**: Systems of unit- FPS, CGS, MKS/SI unit, unit of length, Mass and time, Conversion of units	Engineering Drawing: Introduction and its importance - Relationship to other technical drawing types - Conventions - Viewing of engineering drawing sheets. - Method of Folding of printed Drawing Sheet as per BIS SP:46-2003
2.	**Fractions**: Fractions, Decimal fraction, L.C.M., H.C.F., Multiplication and Division of Fractions and Decimals, conversion of Fraction to Decimal and vice versa. Simple problems using Scientific Calculator.	Drawing Instruments: their Standard and uses - Drawing board, T-Square, Drafter (Drafting M/c), Set Squares, Protractor, Drawing Instrument Box (Compass, Dividers, Scale, Diagonal Scales etc.), Pencils of different Grades, Drawing pins/ Clips.
3.	**Square Root**: Square and Square Root, method of finding out square roots, Simple problem using calculator.	Lines : - Definition, types and applications in Drawing as per BIS SP:46-2003 - Classification of lines (Hidden, centre, construction, Extension, Dimension, Section) - Drawing lines of given length (Straight, curved) - Drawing of parallel lines, perpendicular line - Methods of Division of line segment
4.	**Ratio &Proportion**: Simple calculation on related problems.	Free hand drawing of - Lines, polygons, ellipse, etc. - geometrical figures and blocks with dimension Transferring measurement from the given object to the free hand sketches.
5.	**Percentage**: Introduction, Simple calculation. Changing percentage to fraction and	Lettering and Numbering as per BIS SP46-2003: - Single Stroke, Double Stroke, inclined, Upper case and Lower case. Dimensioning:

	decimal & vice-versa.	Definition, types and methods of dimensioning (functional, non-functional and auxiliary), Types of arrowhead - Leader Line with text
6.	**Material Science**: Properties-Physical & Mechanical, Types–Ferrous & Non-Ferrous, difference between Ferrous and Non-Ferrous metals, introduction of wood (Iron), Cast Iron, Wrought Iron, Steel, difference between Iron and Steel, Alloy steel, carbon steel, stainless steel, Non-Ferrous Alloys.	Drawing of Geometrical Figures: Definition, nomenclature and practice of: - Angle: Measurement and its types, method of bisecting. - Triangle -different types - Rectangle, Square, Rhombus, Parallelogram. - Circle and its elements.
7.	**Mass, Weight and Density**: Mass, Unit of Mass, Weight, difference between mass and weight. Density,unit of density.Relation between mass, weight & density. Simple problems related to mass, weight, and density.	Sizes and Layout of Drawing Sheets - Basic principle of Sheet Size - Designation of sizes - Selection of sizes - Title Block, its position and content - Borders and Frames (Orientation marks and graduations) - Grid Reference - Item Reference on Drawing Sheet (Item List)
8.	**Speed and Velocity**: Rest and motion, speed, velocity, difference between speed and velocity, acceleration, retardation, equations of motions, simple related problems.	Method of presentation of Engineering Drawing - Pictorial View - Orthographic View - Isometric view
9.	**Work, Power and Energy**: work, unit of work, power, unit of power, Horse power of engines, mechanical efficiency, energy, use of energy, potential and kinetic energy, examples of potential energy and kinetic energy.	Symbolic Representation used in the related trade (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

Second Semester Duration: Six Month		
S No.	**Workshop Calculation and Science**	**Engineering Drawing**
1.	**Basic Algebra**: Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).	Construction of Scales and diagonal scale
2.	**Mensuration:** Area and perimeter of square, rectangle, parallelogram, triangle, circle, semicircle Volume of solids – cube, cuboid, cylinder and Sphere. Surface area of solids – cube, cuboid, cylinder and Sphere.	**Dimensioning practice:** - The position of dimensioning (unidirectional, aligned, as per BIS SP:46-2003) Symbols preceding the value of the dimension and dimensional tolerance.
3.	**Trigonometry:** Trigonometrical ratios, measurement of angles. Trigonometric tables	Drawing of Solid figures (Cube, Cuboids, Cone, Prism, Pyramid, Frustum of Cone and Pyramid.) with dimensions. Drawing of Solid figures (Prism, Pyramid, Frustum of Cone and Pyramid.) with dimensions.
4.	**Elasticity:** Elastic & Plastic material. Stress & strain and their units. Young's modulus. Ultimate stress and breaking stress.	Free Hand sketch of hand tools and measuring tools used in the respective trades.
5.	**Heat & Temperature**: Heat and temperature, their units, difference between heat and temperature, boiling point, melting point, Scale of temperature, relations between different scale of temperature. Thermometer, pyrometer. Transmission of heat, conduction, convection, radiation. Thermal Conductivity, Heat loss and heat gain.	**Projections:** - Concept of axes plane and quadrant. - Orthographic projections - Method of first angle and third angle projections (definition and difference) - Symbol of 1st angle and 3rd angle projection as per IS specification.
6.	**Basic Electricity**: Introduction, use of electricity, how electricity is produced, Types of current_ AC, DC, their comparison, voltage, resistance, and their units. Conductor, insulator, Types of connections – series, parallel, electric	Drawing of Orthographic projection in 3rd angle.

	power, Horse power, energy, unit of electrical energy. - Electrical insulating materials. - Basic concept of earthing.	
7.	**<u>Levers and Simple Machines</u>:** Levers and its types. Simple Machines, Effort and Load, Mechanical Advantage, Velocity Ratio, Efficiency of machine, Relationship between Efficiency, velocity ratio and Mechanical Advantage.	Drawing of simple fastener (Rivet, Bolts, Nuts & Screw) - Riveted joints-Butt & Lap (Drawing one for each type).
8.	- Area of irregular surfaces. - Application related to shop problems.	Free hand sketching of simple objects related to trade.
9.	- Material weight and costing - problems related to trade.	- Reading of drawing. Simple exercises related to missing lines, dimensions. How to make queries. - Simple exercises relating missing symbols. - Missing views
10.	- Heat treatment and its necessity.	- Concept of preparation of assembly drawing and detailing. Preparation of simple assemblies & their details of trade related job/exercises with the dimensions from the given sample or models.
11.	-	Reading of fabricated engineering drawing

9.2 EMPLOYABILITY SKILLS

CORE SKILL – EMPLOYABILITY SKILL		
First Semester		
1. English Literacy		**Duration : 20 hrs** **Marks : 09**
Pronunciation	Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)	
Functional Grammar	Transformation of sentences, voice change, change of tense, spellings.	
Reading	Reading and understanding simple sentences about self, work and environment	
Writing	Construction of simple sentences Writing simple English	
Speaking/ Spoken English	Speaking with preparation on self, on family, on friends/ classmates, on known people, picture reading, gain confidence through role-playing and discussions on current happenings, job description, asking about someone's job, habitual actions. Cardinal (fundamental) numbers, ordinal numbers. Taking messages, passing on messages and filling in message forms, greeting and introductions, office hospitality, resumes or curriculum vitae essential parts, letters of application reference to previous communication.	
2. IT Literacy		**Duration : 20 hrs** **Marks : 09**
Basics of Computer	Introduction, computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down the computer.	
Computer Operating System	Basics of Operating System, WINDOWS, 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.	
Word Processing and Worksheet	Basic operating of Word Processing, Creating, opening and closing documents, Use of shortcuts, Creating and Editing 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.	
Computer Networking	Basic of Computer Networks (using real life examples), Definitions of	

and Internet	Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web browser, Website, Webpage and Search Engines. Accessing the Internet using a 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.
3. Communication Skills	**Duration : 15 hrs** **Marks : 07**
Introduction to Communication Skills	Communication and its importance Principles of effective communication Types of communication - verbal, non-verbal, written, email, talking on the phone. Nonverbal communication- characteristics, components-Para-language Body language Barriers to communication and dealing with barriers. Handling nervousness/ discomfort.
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.
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.
Facing Interviews	Manners, etiquettes, dress code for an interview. Do's & Don'ts for an interview.
Behavioral Skills	Problem solving, confidence building, attitude.
Second Semester	
4. Entrepreneurship Skills	**Duration : 15 hrs** **Marks : 06**
Concept of	Entrepreneur - Entrepreneurship - Enterprises: Conceptual issue

Entrepreneurship	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, and the process of setting up a business.	
Project Preparation & Marketing Analysis	Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of PLC, Sales & distribution management. Difference between small scale & large scale business, Market survey, Method of marketing, Publicity and advertisement, Marketing mix.	
Institution's Support	Preparation of project. Role of various schemes and institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financial support agencies to familiarize with the Policies/ programs, procedure & the available scheme.	
Investment Procurement	Project formation, feasibility, Legal formalities i.e., Shop Act, Estimation & costing, Investment procedure - Loan procurement - Banking processes.	
5. Productivity		**Duration : 10 hrs** **Marks : 05**
Benefits	Personal/ Workman - Incentive, Production linked Bonus, Improvement in living standard.	
Affecting Factors	Skills, Working Aids, Automation, Environment, Motivation - How it improves or slows down productivity.	
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.	
Personal Finance Management	Banking processes, Handling ATM, KYC registration, Safe cash handling, Personal risk and insurance.	
6. Occupational Safety, Health and Environment Education		**Duration : 15 hrs** **Marks : 06**
Safety & Health	Introduction to occupational safety and health, importance of safety and health at workplace.	
Occupational Hazards	Basic Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygiene, Occupational Diseases/ Disorders & its prevention.	
Accident & Safety	Basic principles for protective equipment.	

	Accident prevention techniques - control of accidents and safety measures.
First-Aid	Care of injured & sick at the workplaces, First-Aid & Transportation of sick person.
Basic Provisions	Idea of basic provision legislation of India. Safety, health, welfare under legislative of India.
Ecosystem	Introduction to Environment. Relationship between society and environment, Ecosystem and factors causing imbalance.
Pollution	Pollution and pollutants including liquid, gaseous, solid and hazardous waste.
Energy Conservation	Conservation of energy, re-use and recycle.
Global Warming	Global warming, climate change and Ozone layer depletion.
Ground Water	Hydrological cycle, Ground and surface water, Conservation and Harvesting of water.
Environment	Right attitude towards environment, Maintenance of in-house environment.
7. Labour Welfare Legislation	**Duration : 05 hrs** **Marks : 03**
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.
8. Quality Tools	**Duration: 10 hrs** **Marks : 05**
Quality Consciousness	Meaning of quality, Quality characteristic.
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.
Quality Management System	Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.
House Keeping	Purpose of housekeeping, Practice of good housekeeping.
Quality Tools	Basic quality tools with a few examples.

CARPENTER			
LIST OF TOOLS AND EQUIPMENT (For batch of 20 trainees)			
A. TRAINEES TOOL KIT (For each additional unit trainees tool kit S no. 1-19 is required additionally)			
S no.	**Name of the Tool &Equipments**	**Specification**	**Quantity**
1.	Foot rule/steel tape	Two ft. Four fold/6 mtrs.	20 nos.
2.	Steel Measuring Scale	Twelve inch	20 nos.
3.	Marking Knife	200 mm length	20 nos.
4.	Try Square	200mm	20 nos.
5.	Bevel Square	50 mm	20 nos.
6.	Carpenter marking gauge		20 nos.
7.	Carpenter mortise gauge		20 nos.
8.	Hand Saw	450mm	20 nos.
9.	Tenon saw	300mm	20 nos.
10.	Metal Jack plane	335mmX 50mm cutter	20 nos.
11.	Metal smoothing plane	200mm X 50mm cutter	20 nos.
12.	Firmer Chisel	Bevel edge 6mm. 10, 15, 20 and 25mm width (5 nos.)	20 nos.
13.	Mortise chisel	06, 10, 15mm (3 nos.)	20 nos.
14.	Screw driver	300mm	20 nos.
15.	Mallet	medium size	20 nos.
16.	Claw hammer	500 gms	20 nos.
17.	Oil stone	Carborundum universal silicon carbide combination rough and fine.	20 nos.
18.	Contraction measuring scale	as per standard size	20 nos.
19.	Hand brush for cleaning	450mm	20 nos.
B. INSTRUMENT AND GENERAL SHOP OUTFIT			
INSTRUMENT			
20.	Measuring tape	3 meter	01no.
21.	Construction scale	1 meter	04 nos.

22.	Spring caliper (inside)	150 mm	04 nos.
23.	Spring caliper (outside)	150 mm	04 nos.
24.	Wing compass	300 mm	02 nos.
25.	Trammel	300 mm	02 pair
26.	Sprit level	300 mm	02 nos.
C. GENERAL SHOP OUTFIT			
27.	Rip saw	600 mm	04 nos.
28.	Cross cut saw	250 mm	02 nos.
29.	Key hole saw	250 mm	02 nos.
30.	Fret saw frame	150 mm	02 nos.
31.	Compass saw	350 mm	04 nos.
32.	Adze	15 kg	04 nos.
33.	Trying plane metal	450 mm X 60 mm Cutter	02 nos.
34.	Plane rivet adjustable	250 mm X meters x 9 mm Cutters	04 nos.
35.	Plough plane	with set of 8 cutter up to 12 mm Width	04 nos.
36.	Spoke shaves	50 mm Cutter	08 nos.
37.	Plane adjustable circular	250 mm	04 nos.
38.	Router plane	197 X 42 mm	04 nos.
39.	Moulding plane set		04 nos.
40.	Cabinet scraper	100 mm	04 nos.
41.	Gauge chisel, firmer,	6,10,12,16,20mm	08 sets
42.	Gauge chisel, scribing	6,10,12,16,20mm	08 sets
43.	Ball pein hammer	600 grs	04 nos.
44.	Cross pein hammer	600 grs	04 nos.
45.	Screw driver	450 mm	04 nos.
46.	Screw driver	250 mm	04 nos.
47.	Screw driver	150 mm	04 nos.
48.	Pincer	50 mm	04 nos.
49.	File half round	2nd cut 250 mm	08 nos.
50.	File half round	Wood rasp bastard250mm	08 nos.
51.	File slim taper	100 mm	12 nos.

52.	File slim taper	150 mm	12 nos.
53.	Card file (steel) wire brush for file	200 mm	04 nos.
54.	Hands drill	6 mm Capacities	08 nos.
55.	Country drill with bow (ball bearing type)	620 X 726 mm	04 nos.
56.	Ratchet brace	250 mm Swap	04 nos.
57.	Hand auger	10,12,14,16,18,20,22,25 mm	02 sets
58.	Centre bits	6,8,10,12	02 sets
59.	Expansion bit sets	218 X 171 mm	02 sets.
60.	Twist drill bits	6,8,10,12 mm	02 sets
61.	Counter sink bit rose type	12 mm	04 nos.
62.	Breast drill	6 mm. capacity	02 nos.
63.	Centre punch	5mm	04 nos.
64.	Snip straight	200 mm	04 nos.
65.	Oil cans	225 X 225 mm	02 nos.
66.	Combination side cutting pliers	250 X 250 mm	02 nos.
67.	Plunger saw set/ pistol grip type.	300 X 300 mm	02 nos.
68.	Number punch	12 mm.	02 sets
69.	Slip stone	100 mm	08 nos.
70.	Round crow bar	with chisel and claw end 1070 x 25mm	02 nos.
71.	' G' clamp	100 mm	08 nos.
72.	'G' clamp	150 mm	08 nos.
73.	'G' clamp	250 mm	04 nos.
74.	'T' bar cramp	0.6 meter	08 nos.
75.	'T' bar cramp	1.25 meter	04 nos.
76.	'T' bar cramp	1.75 meter	02 nos.
77.	Carpenter vice	250 mm jaws	16 nos.
78.	Saw sharpening vice	250 jaws	02 nos.
79.	Carving tools set		04 sets
80.	Goggles pair		02 nos.
81.	Glass cutter		02 nos.

82.	Nail punch		04 nos.
83.	Surface plate	600x 600 mm	01 no.
84.	Carpenter's work bench	2400x920x800 mm Height	08 nos.
85.	Blower		04 Nos.
86.	Grease gun		01 no.
87.	Spanner double ended	set of 14	01 no. of set
88.	Fire extinguisher		01 no.
89.	Fire buckets		04 nos.
90.	Steel lockers, 8 Compartments, with Individual locks	1980 x 910 x 480 mm depth	02 nos.
91.	Steel Almirah with shelves	1980 x 910 x 480 mm depth	02 nos.
92.	Instructor table (half secretariat)		01 nos.
93.	Instructor chair		02 nos.
94.	Stool		01 nos.
95.	Chalk board with easel		01 nos.
96.	Material rack		01 nos.
D. GENERAL MACHINERY SHOPOUTFIT			
97.	Portable circular saw machine		02 nos.
98.	Portable planning machine		02 nos.
99.	Power drill machine		02 nos.
100.	Portable sander machine		01 nos.
101.	Portable jig saw machine		02 nos.
102.	Portable router machine		01 nos.
103.	Power screw driver		02 nos.
104.	Combined surface and thickener		01 nos.
105.	Circular saw machine	300 mm dia.	01 nos.
106.	'Lathe, wood turning	150 mm height of centres 1.75-meter bed, motorised complete with a set of turning tools	03 nos.
107.	Set of turning tools for above lathe machine		03 sets
108.	Tenoning machine (single ended)		01 no.
109.	Mortising machine (combine		01 no.

	hollow chisel and chain)		
110.	Bench grinder	200 mm. whole D.E. pedestal	01 no.
111.	Drill machine	12 mm. Capacity	01 no.
112.	Portable electric drill	6 mm. Capacity (wolf type)	01 no.
113.	Drills chuck	12 mm capacities.	01 no.
114.	Portable disc sander	200 mm. Dia	01 no.
115.	Adjustable saw sharpener		01 no.
116.	Electric heater	1000/1500 w 1 nos.102. Electric blower (portable)	01 no.
117.	Moisture meter		01 no.
118.	Universal wood working machine		01 no.
119.	Electrical drying oven (small type)		01 no.
120.	Band saw machine with provision		01 no.
E. CLASS ROOM FURNITURE			
121.	Instructor's table and Chair (Steel)		1 set
122.	Students chairs with writing pads		20 nos.
123.	White board size 1200mm X 900 mm		1 no.
124.	Instructors lap top with latest(vista & above) configuration pre-loaded with operating system. and MS Office package.		1 no.
125.	LCD projector with screen.		1 no.
126.	CD & DVD of different joint related to carpenter works and variety design of modern furniture		1 set each (optional)
127.	Visualizer (latest configuration)		1 no.

Note:

1. *No additional items are required to be provided to the batch or unit working in the second shift except the items under the Trainees tool kit and lockers.*
2. *The trainee for the main trade will be sent to the different sections for allied trade training. Separate list of tools and equipment required for allied trades are not included in this list.*

TOOLS &EQUIPMENTS FOR EMPLOYABILITY SKILLS		
S No.	**Name of the Equipment**	**Quantity**
1.	Computer (PC) with latest configurations and Internet connection with standard operating system and standard word processor and worksheet software	10 nos.
2.	UPS - 500Va	10 nos.
3.	Scanner cum Printer	1 no.
4.	Computer Tables	10 nos.
5.	Computer Chairs	20 nos.
6.	LCD Projector	1 no.
7.	White Board 1200mm x 900mm	1 no.
Note: Above Tools &Equipments not required, if Computer LAB is available in the institute.		

ANNEXURE-II

FORMAT FOR INTERNAL ASSESSMENT

Name & Address of the Assessor:			**Year of Enrollment:**
Name & Address of ITI (Govt./Pvt.):			**Date of Assessment:**
Name & Address of the Industry:			**Assessment location: Industry / ITI**
Trade Name:	**Semester:**		**Duration of the Trade/course:**
Learning Outcome:			

SNo	**Candidate Name**	**Father's/Mother's Name**	Safety Consciousness (15)	Workplace Hygiene (5)	Attendance/ Punctuality (10)	Ability to Follow Manuals/ Written Instructions (5)	Application of Knowledge (10)	Skills to Handle tools &Equipment (10)	Economical Use of Materials (5)	Speed in Doing Work (10)	Quality in Workmanship (15)	VIVA (15)	**Total Internal Assessment Marks**	**Result (Y/N)**
Maximum Marks (Total 100 Marks)			**15**	**5**	**10**	**5**	**10**	**10**	**5**	**10**	**15**	**15**		
1														
2														