



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

**COMPETENCY BASED CURRICULUM**

# **PAINTER (GENERAL)**

(Duration: Two Years)

**CRAFTSMEN TRAINING SCHEME (CTS)**

**NSQF LEVEL- 5**



**SECTOR – CHEMICAL**

# **PAINTER (GENERAL)**

**(Engineering Trade)**



**CRAFTSMEN TRAINING SCHEME (CTS)**

**Skill India**

**NSQF LEVEL- 5**

**कौशल भारत - कुशल भारत**

Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

**CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE**

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## 1. COURSE INFORMATION

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During the two years duration of **Painter (General)** trade, a candidate is trained on Professional Skill, Professional Knowledge, Engineering Drawing, Workshop Calculation & Science and Employability Skill. In addition to this, a candidate is entrusted to undertake project work and extracurricular activities to build up confidence. The broad components covered related to the trade are categorized in four semesters each of six months duration. The semester wise course coverage is categorized as below:

**1<sup>st</sup> Semester-** The practical part starts with practice different types of sketching, ability to synthesize of free hand sketching OF different objects etc. Identifying the paper, colour schemes and compose different types of colour shade expertise in 2D design. He will also practice sketches of different types of letters with colour shades. The safety aspect covers components like PPE, Fire extinguisher, First Aid.

**2<sup>nd</sup> Semester** –This semester starts with allied trades training viz. basic fitting, marking, chiseling, filing, drilling and pipe fitting etc. He will practice for manufacturing of simple sheet metal items as per drawing and join them by riveting. Execute different types of operating system and explore the working on DTP, corel draw, photo shop etc. Involved to making of different shapes in ornamental design, text, symbols etc. Produce sign board, name plate and preparing back ground painting, screen printing.

**3<sup>rd</sup> Semester** – This semester covers to development of craft work and artistic work on radium/vinyl/thermocolor etc. He will also learn the techniques of decorative painting on wooden surface. Practice on internal and external building painting by using different decorative press. He will also learn painting of windows, grill, doors and different metal surface and pipes.

**4<sup>th</sup> Semester** – During this semester he will practice the process of cleaning and painting on metal surface for preventive coating. Maintenance of different pneumatic components of paint gun, compressor, filter, pressure gauge, regulator, valve etc. Practicing of spray painting technique and also work on spray booths. Finding out the aspect ratio of missing of paint, hardner and solvent. Identify and apply of spray painting in home appliances, agricultural equipments and automotive bodies after removing of dents and recover the damaged parts. Identifying different types of power coating and apply the power coating technique in appropriate place. He will also integrate quality testing for various paints and painted films.

### 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 Labour market. The vocational training programmes are running under aegis of National Council of Vocational Training (NCVT). Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) are two pioneer programmes under NCVT for propagating vocational training.

The 'Painter (General)' trade under CTS is one of the popular newly designed courses. The course is of two years (04 semester) duration. It mainly consists of Domain area and Core area. In the Domain area (Trade Theory & Practical) impart professional skills and knowledge, while Core area (Workshop Calculation & science, Engineering Drawing and Employability Skills) impart requisite core skill, knowledge and life skills. After passing out the training program, 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 & interpret technical parameters/documentation, plan and organize work processes, identify necessary materials and tools;
- Perform tasks with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional knowledge, core skills & employability skills while performing the job, and repair & maintenance work.
- Document the technical parameters in tabulation sheet related to the task undertaken.

### 2.2 CAREER PROGRESSION PATHWAYS:

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



## 2.3 COURSE STRUCTURE:

Table below depicts the distribution of training hours across various course elements during a period of two-years (04 semesters): -

S No.	Course Element	Notional Training Hours
1	Professional Skill (Trade Practical)	2158
2	Professional Knowledge (Trade Theory)	504
3	Workshop Calculation & Science	168
4	Engineering Drawing	252
5	Employability Skills	110
6	Library & Extracurricular Activities	168
7	Project Work	320
8	Revision & Examination	480
	<b>Total</b>	<b>4160</b>

## 2.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of the course and at the end of the training program as notified by the Government of India (GoI) from time to time. The employability skills will be tested in the first two semesters itself.

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 has to maintain an 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 Government 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 the basis for setting question papers for final assessment. The examiner during final examination will also check** the 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 of theory subjects is 40%. For the purposes of determining the overall result, 25% 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 the assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/waste as per procedure, behavioral attitude, sensitivity to the 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 examining 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	<ul style="list-style-type: none"> <li>• Demonstration of good skill in the use of hand tools, machine tools and workshop equipment.</li> <li>• Below 70% tolerance dimension achieved while undertaking different work with those demanded by the component/job.</li> <li>• A fairly good level of neatness and consistency in the finish.</li> <li>• Occasional support in completing the project/job.</li> </ul>

(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	<ul style="list-style-type: none"> <li>• Good skill levels in the use of hand tools, machine tools and workshop equipment.</li> <li>• 70-80% tolerance dimension achieved while undertaking different work with those demanded by the component/job.</li> <li>• A good level of neatness and consistency in the finish.</li> <li>• Little support in completing the project/job.</li> </ul>
(c) Weightage in the range of more than 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.	<ul style="list-style-type: none"> <li>• High skill levels in the use of hand tools, machine tools and workshop equipment.</li> <li>• Above 80% tolerance dimension achieved while undertaking different work with those demanded by the component/job.</li> <li>• A high level of neatness and consistency in the finish.</li> <li>• Minimal or no support in completing the project.</li> </ul>

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#### **Brief description of job roles:**

Painter, General applies decorative or protective coats of paint, varnish, shellac, enamel, lacquer or other materials on exterior or interior surfaces, trimming and fixtures of glass, metal, wood, plaster concrete brick, building boards or other objects using brush, spray gun, roller, stencils etc. Receives work order and selects correct type of paint materials with the consideration to suitability, durability, ease of application and estimated cost. Mixes pigments, oils and other ingredients to material where required by manual or mechanical mixing device using paddle or electric mixer to obtain desired colour, shade and consistency. Removes dirt, grease or rough spots and irregularities by scrapers, chemicals and abrasives and patches cracks and holes with putty or other filler. Covers surface with appropriate prime coat or sealer to have suitable surface or base for paint. Brushes, sprays or stencils one or more coats of material on surfaces. May finish or decorate surfaces by gilding, silvering or painting over stencils. May be designated according to object coated or material used. May mix paint with linseed oil, colouring matter of materials, labour, etc. May erect scaffolds to facilitate work.

Plan and organize assigned work and detect & resolve issues during execution. 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: 7132.0100**

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## 4. GENERAL INFORMATION

<b>Name of the Trade</b>	<b>PAINTER (GENERAL)</b>
<b>NCO - 2015</b>	7132.0100
<b>NSQF Level</b>	Level-5
<b>Duration of Craftsmen Training</b>	2 Years (4 Semesters each of six months duration)
<b>Entry Qualification</b>	Passed 10 <sup>th</sup> class examination under 10+2 System of education.
<b>Unit Strength (No. Of Students)</b>	16 (Max. supernumeraries seats: 5)
<b>Space Norms</b>	104 Sq. m
<b>Power Norms</b>	5 KW
<b>Instructors Qualification for:</b>	
<b>1. Painter (General) Trade</b>	<p>Degree in Paint Technology/ Bachelor of fine arts from recognized Engineering college/ university with one year experience in the relevant field.</p> <p style="text-align: center;"><b>OR</b></p> <p>Diploma in Paint Technology/Painting from recognized board of technical education with two years experience in the relevant field.</p> <p style="text-align: center;"><b>OR</b></p> <p>NTC/NAC passed in the Trade of "Painter General" with 3 years post qualification experience in the relevant field.</p> <p><b><u>Desirable:</u></b> Preference will be given to a candidate with CITS (Craft Instructor Training Scheme) in relevant Trade.</p>
<b>2. Workshop Calculation &amp; Science</b>	<p>Degree in Engineering with one year experience.</p> <p style="text-align: center;"><b>OR</b></p> <p>Diploma in Engineering with two-year experience.</p> <p><b><u>Desirable:</u></b> Craft Instructor Certificate in RoD &amp;A course under NCVT.</p>
<b>3. Engineering Drawing</b>	<p>Degree in Engineering with one year experience.</p> <p style="text-align: center;"><b>OR</b></p> <p>Diploma in Engineering with two-year experience.</p> <p style="text-align: center;"><b>OR</b></p> <p>NTC/ NAC in the Draughtsman (Mechanical/ Civil) with three-year experience.</p>

	<b>Desirable:</b> Craft Instructor Certificate in RoD & A course under NCVT.					
<b>4. Employability Skill</b>	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. <p style="text-align: center;"><b>AND</b></p> Must have studied English/ Communication Skills and Basic Computer at 12th/ Diploma level and above. <p style="text-align: center;"><b>OR</b></p> <b>Existing Social Studies Instructors duly trained in Employability Skills  from DGT institutes</b>					
<b>List of Tools and Equipment</b>	As per Annexure – I					
<b>Distribution of training on hourly basis: (Indicative only)</b>						
<b>Total Hours /Week</b>	<b>Trade Practical</b>	<b>Trade Theory</b>	<b>Workshop Cal. &amp;Sc.</b>	<b>Engg. Drawing</b>	<b>Employability Skills</b>	<b>Extra-curricular activity</b>
40 Hours	25 Hours	6 Hours	2 Hours	3 Hours	2 Hours	2 Hours

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## 5. NSQF LEVEL COMPLIANCE

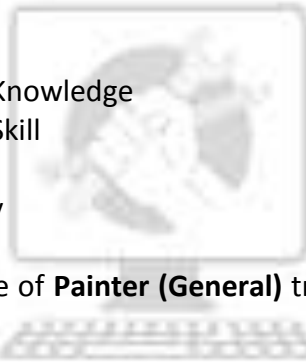
NSQF level for **Painter (General)** trade under CTS: **Level 5**

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 **Painter (General)** trade under CTS mostly matches with the Level descriptor at Level- 5.

The NSQF level-5 descriptor is given below:

Level	Process Required	Professional Knowledge	Professional Skill	Core Skill	Responsibility
Level 5	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 work and learning.

## 6. LEARNING/ ASSESSABLE OUTCOME

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***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 LEARNING OUTCOME

1. Recognize & comply safe working practices, environment regulation and housekeeping.
2. Understand, explain different mathematical calculation & science in the field of study including basic electrical and apply in day to day work. *[Different mathematical calculation & science -Work]*
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, scales, Different Projections, Machined components & different thread forms, Assembly drawing, Sectional views, Estimation of material, Electrical & electronic symbol]*
4. Select and ascertain measuring instrument 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 organize the work related to the occupation.

### 6.2 SPECIFIC LEARNING OUTCOME

#### Semester –I

9. To make different types of sketching viz., free Hand sketching of different objects, designing of different shapes, size, geometrical shapes of different objects.
10. Ability to synthesize of free Hand sketching of Human figures, Shading, Use graph & figure enlargement.
11. Identify of paper, colour schemes and compose different types of colour shade Expertise in 2D design.
12. Create different types of realistic objects viz., bird, animals, realistic human figure with application of colour shades.



13. Demonstrate with colour shades different types letters (Devanagari, roman, gothic, Text writing/ lettering.) and apply them in appropriate place.

### **Semester-II**

14. Plan and organize the work to make job as per specification applying different types of basic operation. [*Basic fitting operation – marking, Chiseling, Filing, Drilling, Pipe fitting*]
15. Manufacture simple sheet metal items as per drawing and join them by riveting. (like- Screen frame, sign board, & hanging Paintings frame)
16. Execute different types of Operating System and explore the working on DTP, Corel Draw, Photo shop etc.
17. Produce stencils involving different shapes in ornamental design, text, symbols etc. operations for different medium like papers, cards, tin, foam board, observing procedure and check for accuracy.
18. Produce Sign board, Name plate. prepare back ground painting, screen printing, Observe finishing, lettering proportion & evenness

### **Semester-III**

19. Develop a craft work and artistic work on radium/ vinyl/ thermocol etc.
20. Identify different types of Plywood, MDF & low-quality wood and make wooden surface used various techniques, decorate, paint & make an attractive wooden article.
21. Develop internal and external Building painting by using different decorative press.
22. Choose different pipes as per safety aspect and apply line painting with colour code.

### **Semester-IV**

23. Process of cleaning and painting on metal surface for preventive coat.
24. Identify, replace and assemble different pneumatics and paint gun. [Different components– Compressor, Pressure Gauge, Filter Regulator, Valve for hose]
25. Perform Spray Painting technique. (Spray Gun / hose handling, air & paint pressure controlling,)
26. Operate the system of spray booths, Oven, cleaning & their maintenance, application of sealant component on metallic joints.
27. Perform aspect ratio mixing of paint, hardner & solvent. Measure Viscosity of paint. Operate the Spray painting system.
28. Identify and apply of spray painting in Home appliances, Agricultural equipment's, Machines, Automotive Bodies etc.
29. Removal of dents & recover the damaged accidental area. Repaint & recovering damaged area.

30. Finish special effects for Modern furniture.
31. Identify different types of powder coating and apply the Powder coating technique in appropriate place.
32. Integrate quality testing for various Paints & Painted films.



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## 7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

<b>GENERIC LEARNING/ ASSESSABLE OUTCOME</b>	
<b>LEARNING/ ASSESSABLE OUTCOME</b>	<b>ASSESSMENT CRITERIA</b>
1. Recognize & comply 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 off 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 in regard 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, explain different mathematical calculation & science in the field of study	2.1 Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat & temperature, force, motion, pressure, heat

including basic electrical and apply in day to day work. <i>[Different mathematical calculation &amp; science -Work]</i>	treatment, centre of gravity, friction.
	2.2 Measure dimensions as per drawing
	2.3 Use scale/ tapes to measure for fitting to specification.
	2.4 Comply 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 & earthing.
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3. Interpret specifications, different engineering drawing and apply for different application in the field of work. <i>[Different engineering drawing- Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Machined components &amp; different thread forms, Assembly drawing, Sectional views, Estimation of material, Electrical &amp; electronic symbol]</i>	3.1 Read & interpret the information on drawings and apply in executing practical work.
	3.2 Read & analyse the specification to ascertain the material requirement, tools, and machining /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.
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4. Select and ascertain measuring instrument and measure dimension of components and record data.	4.1 Select appropriate measuring instruments such as micrometers, vernier calipers, dial gauge, bevel protector and height gauge (as per tool list).
	4.2 Ascertain the functionality & correctness of the instrument.
	4.3 Measure dimension of the components & record data to analyse the with given drawing/measurement.
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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 familiarizes 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 organize 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 Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same.

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SPECIFIC LEARNING/ ASSESSABLE OUTCOME	
LEARNING/ ASSESSABLE OUTCOME	ASSESSMENT CRITERIA
<b>Semester-I</b>	
9. To make different types of sketching viz., free Hand sketching of different objects, designing of different shapes, size, geometrical shapes of different objects.	9.1 Make a practice of different lines and strokes, nature forms like- flowers, leaves, trees, birds and animals
	9.2 Explain most useful for improving hand force and object proportion optically by free hands sketching practice.
	9.3 Explain importance of graphics & perspective.
	9.4 Draw geometrical shapes and construct for design.
	9.5 Draw free hand geometrical forms in perspective.
	9.6 Draw free hand different types of perspective.
10. Ability to synthesize of free Hand sketching of Human figures, Shading, Use graph & figure enlargement.	10.1 Draw free hands sketching practice of human figures.
	10.2 Test & verify types of pencils.
	10.3 Develop the anatomy of human figures (Male, female & children)
	10.4 Draw black & white/ colour pencil shading of human figures
	10.5 Make with graph and figure enlargement with pencil.
	10.6 Find and rectify trade tools and equipments and draw with shading.
11. Identify of paper, colour schemes and compose different types of colour shade Expertise in 2D design.	11.1 Marking & Cutting different Drawing Paper as per given size.
	11.2 Identify and draw Colour wheel with poster colour.
	11.3 Draw & Colour Design in primary, Secondary & Tertiary colours.
	11.4 Marking & Out line Drawing 2D Design.
	11.5 Colouring 2D design in Warm & Cool Colour.
	11.6 Make 2D design & Colour in Contrast colours.
	11.7 Identify and make colour shades:
	11.8 Make gray scale in pencil shading.
	11.9 Make gray scale in poster colour.
	11.10 Make different colour Scale in poster colour.

	11.11 Make 2D Design in different composition paint in High key, middle key & low key.
	11.12 Make practice of colour mixing & matching touch-up on damage posters & photographs.
12. Create different types of realistic objects viz., bird, animals, realistic human figure with application of colour shades.	12.1 Collect and observe pictures of birds and animals.
	12.2 Draw and sketch proportionally observed pictures.
	12.3 Make a colour realistic drawing of Birds as per reference.
	12.4 Make a colour realistic drawing of Animals as per reference compare it and verify.
	12.5 Observe different colour photographs & pictures, draw & colour realistic drawing of Human figure.
	12.6 Mounting for better presentation of Painted pictures.
	12.7 Observe different nature spots, make a good composition on paper and draw Land Scene.
	12.8 Make practice match the colour from nature & colouring Landscape in water/ poster colour.
	12.9 Enlargement practice of pictures by graph on different picture & paint it as per referred drawing.
	12.10 Compose, draw & colour Safety or Related Trade Poster.
	12.11 Enlarge the Sketch and colour Cinema Posters.
13. Demonstrate with colour shades different types letters (Devanagari, roman, gothic, Text writing/ lettering.) and apply them in appropriate place.	13.1 Sketching & colouring gothic letters in English.
	13.2 Sketching & colouring gothic letters in Mother Language.
	13.3 Sketching & colouring Roman letters.
	13.4 Do free hand Strokes practice for Devanagari.
	13.5 Sketching & colouring Devanagari letters.
	13.6 Sketching & colouring Text or Italic letters.
<b>Semester-II</b>	
14. Plan and organize the work to make job as per specification applying different types of basic operation. <i>[Basic fitting operation – marking, Chiseling, Filing,</i>	14.1 Marking Practice on wood.
	14.2 Apply holding & sawing practice on different size of wood.
	14.3 Work on teeth setting & sharpening of different saw.
	14.4 Apply tenoning half cut on wooden border.
	14.5 Make setting of planers & sharpening on plane blade.



<i>Drilling, Pipe fitting]</i>	14.6	Do plane on different wooden surfaces.
	14.7	Do chiseling slots on thick wood.
	14.8	Drilling on wood with different drilling tools (Gimlet, Hand Drill, Portable elect. drilling machine.
	14.9	Identify & check different types of pipe.
	14.10	Do pipe cutting & threading
	14.11	Apply different types of pipe joint/ fitting of different materials & different diameter. (Use PVC pipe)
	14.12	Make joint/ fitting for rain water (Use PVC pipe)
	14.13	Make joint/ fitting for water pipe line (Use GI pipe)
	14.14	Make joint/ fitting for water pipe line (Use PVC pipe)
15. Manufacture simple sheet metal items as per drawing and join them by riveting. (like- Screen frame, sign board, & hanging Paintings frame)	15.1	Make a simple lap joint.
	15.2	Make a simple mitred half lap joint.
	15.3	Make a simple Dovetail joint.
	15.4	Apply Joint fitting with nails, screw, glue etc.
	15.5	Marking practice of straight lines, circles, profiles and various geometrical shapes.
	15.6	Cutting practice of straight lines, circles, profiles and various geometrical shapes on sheets with snips.
	15.7	Marking out of simple development.
	15.8	Marking out for fold for joints.
	15.9	Make the joint of hemming, form locked.
	15.10	Make the joint of grooved and knocked up single hem
	15.11	Make the joint of straight and curved edges form double hemming.
	15.12	Make cylindrical objects with joints.
16. Execute different types of Operating System and explore the working on DTP,	16.1	Operate & familiarize with computer operating system.
	16.2	Operate paint software & draw freehand sketch & practice on color bucket, eraser, pencil & all tools.

Corel Draw, Photo shop etc.	16.3	Draw scenery like realistic in paint software
	16.4	Tool handling in photo shop familiarise with all hand tools.
	16.5	Make a different layer & create background, artistic text, design, images.
	16.6	Apply import photo image from file & scanner, edit photo images.
	16.7	Edit Image adjustment effects. & layer style effects.
	16.8	Edit special effect on different layer, colours, textures, filter effects.
	16.9	Edit & Save image in PSD, JPEG & other format.
	16.10	Create a colour advertise design for festival offer
	16.11	Develop export Design, image, photograph from Photoshop to other different format for different software's. & make a print & print file for different printers.
	16.12	Tool handling in Corel draw familiarise with all hand tools Apply select /move /copy /objects, retire skew, size Objects.
	16.13	Apply Combine, Shape, weld, trim, Align, Group / Ungroup objects.
	16.14	Practice on add text & Format text create different heading & Sub-heading.
	16.15	Draw dimensionally objects. Creating special effects for backgrounds & related objects.
	16.16	Do graphical effects to tex. Creating symbols, logo, special effects.
16.17	Make a flex design for marketing offers. Convert & Save to CD/ DVD/ PD for final printing.	
17. Produce stencils involving different shapes in ornamental design, text, symbols etc. operations for different medium like papers, cards, tin, foam board, observing procedure and check for accuracy.	17.1	Create ornamental designs for stencils.
	17.2	Cut the stencils & make a print.
	17.3	Draw simple sentence in different lettering stencil.
	17.4	Cutting & stencilling the letters.

<p>18. Produce Sign board, Name plate. prepare back ground painting, screen printing, Observe finishing, lettering proportion &amp; evenness.</p>	<p>18.1 Make sign board</p> <p>18.2 Paint the background of sign board.</p> <p>18.3 Make Figure Enlargement for sign board.</p> <p>18.4 Draw and painting letters &amp; design or logo on Sign Board.</p> <p>18.5 Practice the Painting of name plate on different material</p>
<p><b>Semester-III</b></p>	
<p>19. Develop a craft work and artistic work on radium/ vinyl/ thermocol etc.</p>	<p>19.1 Use manually ornamental design on radium or vinyl.</p> <p>19.2 Create symbol or image design by computer graphics.</p> <p>19.3 Cut it with plotter.</p> <p>19.4 Do "Instruction board" on acrylic sheet with help of malty layer radium or vinyl.</p> <p>19.5 Make a lettering/ image/ symbol design for "Instruction board" by computer graphics, with help of radium or vinyl &amp; cutting it with plotter, pasting on glass/ acrylic/ sun mica or different sheets.</p> <p>19.6 Create a design for wall decoration by computer in graphics &amp; cut it on multi colour vinyl, paste on wall.</p>
<p>20. Identity different types of Plywood, MDF &amp; low-quality wood and make wooden surface used various techniques, decorate, paint &amp; make an attractive wooden article.</p>	<p>20.1 Apply Cleaning, sanding, knotting, stooping, staining preparation on wooden surface properly for polish.</p> <p>20.2 Make &amp; apply putty for varnishing &amp; polishing.</p> <p>20.3 Apply polish on prepared wooden surface with cotton rags.</p> <p>20.4 Apply Cleaning, sanding, knotting, stooping, staining preparation wooden surface properly for varnish.</p> <p>20.5 Apply varnish on prepared wooden surface with brush.</p> <p>20.6 Prepare wooden article &amp; apply varnish with spray.</p> <p>20.7 Prepare wooden article &amp; apply melamine or PU wooden finish with spray.</p> <p>20.8 Make a wooden top with thick layer of melamine polish.</p> <p>20.9 Prepare wooden surface properly for painting.</p> <p>20.10 Practice of applying wood primer by brush.</p> <p>20.11 Make a putty for wood finishing.</p> <p>20.12 Apply putty &amp; prepare wooden surface properly.</p>

	20.13 Do paint wooden surface properly with brush
	20.14 Prepare & spray painting on different furniture take the all precautions.
21. Develop internal and external Building painting by using different decorative press.	21.1 Prepare ceiling & Wall surface for lime wash. (Sanding & Cleaning)
	21.2 Apply POP on wall.
	21.3 Make & mixing of lime & Steiner.
	21.4 Apply Lime on ceiling & wall with brush properly.
	21.5 Prepare ceiling & wall for distemper painting.
	21.6 Make wall putty for distempering.
	21.7 Apply wall putty with finish & prepare wall surface.
	21.8 Mixing & apply a distemper properly for wall.
	21.9 Prepare ceiling & wall surface with putty & Apply interior emulsion paint. Use roller & brush.
	21.10 Prepare interior wall surface with putty, Apply enamel or luster paint.
	21.11 Making process of scaffolding for exterior wall painting.
	21.12 Clean exterior wall area with cleaning process & water pressure process.
	21.13 Prepare exterior wall with white cement for painting.
	21.14 Paint the prepared wall by brush with cement paint.
	21.15 Prepare exterior wall with exterior priming for painting.
	21.16 Paint the prepared wall by brush with emulsion paint.
	21.17 Decorate the projection with dark shade apply special shades of emulsion colour.
	21.18 Prepare wall & design wall paper pasting on wall.
	21.19 Find the defects on wall before painting and remove it.
	21.20 Find the defects on wall after painting and remove it.
22. Choose different pipes as per safety aspect and apply line painting with colour code.	22.1 Cleaning, Sanding, or wire brushing & paint by brush windows, grill, doors, safety doors, gate etc.
	22.2 Prepare Paint & painting on ceiling and wall. use dip-feed roller / pad or airless spray.
	22.3 Paint the GI pipe by brush.

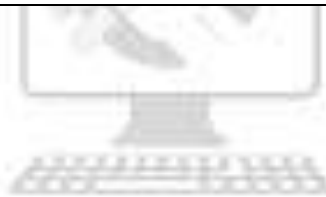
	22.4	Paint the sanitary pipe of building. Take & care self precaution & safety.
	22.5	Paint the MS square & round pipe, take all precautions & safety while painting.
	22.6	Do Paint deferent pipe line with colour code as per ISI.
	22.7	Demonstrate knowledge of safety procedures in Industrial pipe line painting
	22.8	Identify colour code wise– Pipe lines, different types of valves.
<b>Semester-IV</b>		
23. Process of cleaning on metal surface for preventive coat.	23.1	Do Scrap on corrode metal surface.
	23.2	Cleaning process of metal surface by wire brush or orbital wire brush.
	23.3	Apply burn process on old paint from metal surface by blow lamp or gas flame.
	23.4	Apply dry sanding with help of emery paper/cloth.
	23.5	Apply wet sanding on old painted object.
	23.6	Clean the metal surface by Sander machine.
	23.7	Do level the different metal surface by portable hand grinder.
24. Identify, replace and assemble different pneumatics and paint gun. [Different components– Compressor, Pressure Gauge, Filter Regulator, Valve for hose]	24.1	Prepare metal surface & apply ready primer on metal surface by brush.
	24.2	Apply enamel/ polyester putty or filler on primed surface.
	24.3	Apply enamel paint on primed metal surface by brush.
	24.4	Prepare and paint metallic article by brush.
	24.5	Prepare & colour making for deep painting.
	24.6	Prepare article for deep painting. (Cleaning, rubbing, sandig.)
	24.7	Explain the Electro coat Deeping process & conveyor system with all safety.
	24.8	Identify pneumatic components – Compressor, pressure gauge, Filter, Regulator, and Lubricator. Different types of valves.
	24.9	Explain the safety procedures in spray systems and personal Protective Equipment (PPE).

	24.10 Maintenance, troubleshooting, and safety aspects of pneumatic and Painting instruments.
25. Perform Spray Painting technique. (Spray Gun / hose handling, air & paint pressure controlling,)	25.1 Application of spray gun holding and stroke adjustment, Paint adjustment, air adjustment techniques. 25.2 Spraying practice on the surface like as edges, corner, square, round & curved area.
26. Operating system of spray booths, Oven, cleaning & their maintenance, application of sealant component on metallic joints.	26.1 Use and apply of paint spray booth & maintenance, troubleshooting, safety aspects. 26.2 Use & Operation of Oven Setting, temperature & timing. 26.3 Apply sealant on metallic joints.
27. Perform aspect ratio mixing of paint, hardner & solvent. Measure Viscosity of paint. Operate the Spray painting system.	27.1 Preparation of Paint mixing for spray painting. 27.2 Measure the viscosity of paint. 27.3 Spray Painting practice on ornamental objects, with deferent types of paints. 27.4 Spraying metallic primer on metal surface. 27.5 Apply Carpatch, Putty and Filler on metallic surface & preparation. 27.6 Apply Surfacer on primed or putty finish surface. 27.7 Spraying finish application for Top Coat. Use of enamel/ N.C. paints. (Or latest paints.)
28. Identify and apply of spray painting in Home appliances, Agricultural equipment's, Machines, Automotive Bodies etc.	28.1 Prepare the surface of home appliances. 28.2 Priming & surfacing process on home appliances. 28.3 Apply finish undercoat & top coat on home appliances. 28.4 Use enamel/ N.C./ P.U. paints- Solid/ Metallic/ Pearl/. 28.5 Application of preparing machine surface. 28.6 Priming & surfacing on machine. 28.7 Application of finish undercoat & top coat on machine. 28.8 * Use Enamel/ Epoxy/N.C./ P.U. /paints. (Or latest paints.) 28.9 Preparation of the tow wheeler body and spares

	surface.
	28.10 Priming & surfacing the Tow wheeler body and spares surface.
	28.11 Apply finish undercoat & top coat on Tow wheeler body and spares surface. Use Automotive paints.
	28.12 Apply Graphic sticker on painted surface properly & apply lacquer coat evenly.
	28.13 Use Enamel/ N.C./ P.U. paints/- Solid/ Metallic. (Or latest paints.)
	28.14 Identify the parts of Electrostatic gun assembly & operate it carefully.
	28.15 Identify the parts of Airless gun assembly & 28.16 Operate it carefully.
	28.17 Practice of Different types of Spray painting.
29. Removal of dents & recover the damaged accidental area. Repaint & recovering damaged area.	29.1 Disassemble essential damage parts, inspect & mark denting area. Choose & decide process tools for denting.
	29.2 Removed dent on marked area, apply essential method.
	29.3 Do sanding or burn on denting area & apply primer & surface. Apply putty layer on spotted area evenly.
	29.4 Use wet sanding, level denting surface area, procedure of thin coat of Surfacer.
	29.5 Masking process on unwanted area properly.
	29.6 Match the shade Overlay proper equally on unmask area.
	29.7 Unmasked the mask area carefully & checkout properly & touch-up it by necessary process.
	29.8 Apply final coat rubbing and waxing process properly.
	29.9 Demonstrate of Paint defects & its remedies.
	29.10 Check & Find out different paint defects (run down, sagging, pin hole, orange peel, oil & water spot, over/dry spray, uncover, shade variation etc.)
	29.11 Mark the defected area, Decide Techniques & apply remedies properly. Make Finished surface.
30. Finish special effects for	30.1 Application Process of Finish special effects on different



Modern furniture.	furniture & different surface. (like as- colour gradations, multy tones applying, different textures, etc.)
31. Identify different types of powder coating and apply the Powder coating technique in appropriate place.	31.1 Pretreatment & Clean the metallic article in chemical (degreasing, de-rusting, activation, phosphating, passivation & water rinsing as where required etc.)
	31.2 Procedure of powder coating on cleaned article & baking in oven. Apply appropriate temperature & timing.
32. Integrate quality testing for various Paints & Painted films.	32.1 Check and identify the Paint defects & its remedies.
	32.2 Testing the quality of paints & Painted surfaces by various testing method & instruments.



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<b>SYLLABUS FOR PAINTER (GENERAL) TRADE</b>			
<b>FIRST SEMESTER- 6 MONTHS</b>			
<b>Week No.</b>	<b>Ref. Learning Outcome</b>	<b>Professional Skills (Trade Practical) With Indicative Hours</b>	<b>Professional Knowledge (Trade Theory)</b>
1-2	Recognize & Comply Safe working practices environment, Regulation, Familiarization and Housekeeping	<ol style="list-style-type: none"> <li>1. Introduction of trade skills and work application. (02 hrs)</li> <li>2. Safety attitude development of the trainee by educating them to use personal protective equipment (PPE) and Material safety data sheet (MSDS). (05 hrs)</li> <li>3. First-aid method and basic training. (02 hrs)</li> <li>4. Safe disposal of waste materials like- cotton waste, waste paint and waste paint material etc. (02 hrs)</li> <li>5. Hazard and non hazard identification and avoidance. (02 hrs)</li> <li>6. Use of firefighting equipment, like- extinguishers, sand bucket, water etc. (10 hrs)</li> <li>7. Identification of safety signs, like- Danger, warning, caution and personnel safety .(01 hr)</li> <li>8. Importance of trade training. (02 hrs)</li> <li>9. Understand precautions to be followed while working in the painting jobs. (02 hrs)</li> <li>10. Motivational talk by experts. (05 hrs)</li> </ol>	<p>Introduction of the Institution; rules and management (work) Process of an Institution. Knowledge about the facilities; leaves and rules and subjects an syllabus. Introduction of vocational trade, The importance of trade in the industrial Development of the nation Care in Vocational trade</p>

		<p>11. 5S training (02 hrs)</p> <p>12. Draw different sketches and hand writing practice (15 hrs)</p>	
3	-Do-	<p>13. Introduction and identification of tools and equipments different for cleaning and painting. (15 hrs)</p> <p>14. Identification and there assembly and function of trade machineries. (10 hrs)</p>	<p>Accident and First-Aid: Cost of Accidents; Causes and effects of an accident; First-Aid in case of internal injuries; fracture; wound and electric shock.</p>
4-5	To make different types of sketching viz., free Hand sketching of different objects, designing of different shapes, size, geometrical shapes of different objects.	<p>15. Free hands sketching practice of different lines and strokes. (17 hrs)</p> <p>16. Free hands sketching practice of nature forms like- flowers, leaves, trees. (17 hrs)</p> <p>17. Free hands sketching practice of birds and animals. (16 hrs)</p>	<p>Lines- Different types of lines; its uses and specialty. Pencil- Origin of pencil and its introduction. Different types of pencils; uses and its specialty.</p>
6	-Do-	<p>18. Draw geometrical shapes and construct for design (15 hrs)</p> <p>19. Draw free hand geometrical forms in perspective (5 hrs)</p> <p>20. Draw free hand different types of perspective. (5 hrs)</p>	<p>Colours for drawing and painting: charcoals, oil and dry pestles, water; poster; acrylic ; oil colours and reducer medium</p>
7-9	Ability to synthesize of free Hand sketching of Human figures, Shading, Use graph & figure enlargement.	<p>21. Free hands sketching practice of human figures. (15 hrs)</p> <p>22. Black &amp; white/ colour pencil shading of human figures (Male, female &amp; children). (30 hrs)</p> <p>23. Graph and figure enlargement with pencil shading. (10 hrs)</p> <p>24. Draw with shading different tools and equipments of trade. (20 hrs)</p>	<p>Definition and Need of Sketching-Introduction to sketching; its benefits and importance in our culture and traditions as well to the trainees.</p> <p>Human organs and their proper place; Body structures of Male and Female.</p>
10-11	Identify of paper, colour schemes and compose different types of colour	<p>25. Marking &amp; Cutting different Drawing Paper as per given size. (05 hrs)</p>	<p>Colours &amp; Colour knowledge: Definition of colour; colour blindness; tone, colour shade-</p>

	shade Expertise in 2D design.	<p>26. Draw Colour wheel with poster colour. (10 hrs)</p> <p>27. Draw &amp; Colour Design in primary, Secondary &amp; Tertiary colours. (10 hrs)</p> <p>28. Marking &amp; Out line Drawing 2D Design. (05 hrs)</p> <p>29. Coloring 2D design in Warm &amp; Cool Colors. (10 hrs)</p> <p>30. Make 2D design &amp; Colour in Contrasts colors. (10 hrs)</p>	primary, secondary, tertiary.
12	-Do-	<p>Make Colour shades:</p> <p>31. Make gray scale in pencil shading (5hrs)</p> <p>32. Make gray scale in poster colour (5hrs)</p> <p>33. Make different colour Scale in poster colour (15 hrs)</p>	Colour wheel, colours & Different types of colour schemes & colour harmony.
13	-Do-	<p>34. Make 2D Design in different Composition paint in High key, middle key &amp; low key by poster colour. (20 hrs)</p> <p>35. Colour Mixing &amp; Matching Touch up on Damage posters &amp; photographs. (5 hrs)</p>	Brush: Different types of Brushes with shapes & sizes. Use & Care of Brushes.
14-15	Create different types of realistic objects viz., bird, animals, realistic human figure with application of colour shades.	<p>36. Draw &amp; colour realistic drawing of Birds. (25 hrs)</p> <p>37. Draw &amp; colour realistic drawing of Animals. (25 hrs)</p>	Drawing instruments- Drawing board; T- square; steel and wooden scale; set square; compass; Colour dish;
16	-Do-	<p>38. Draw &amp; colour realistic drawing of Human figure. (20 hrs)</p> <p>39. Mounting &amp; Decorate Painted Pictures. (05 hrs)</p>	Brush- Different types of brushes with shapes and sizes. Uses and care of brush.

17-18	-Do-	<p>40. Draw Landscape. (05 hrs)</p> <p>41. Colouring Landscape in water/poster colour. (15 hrs)</p> <p>42. Use graph on portrait picture &amp; Enlarge outline drawing on drawing paper. (05 hrs)</p> <p>43. Water or poster colouring on enlarged drawing (15 hrs)</p> <p>44. Draw &amp; Colour Safety or Related Trade Poster. (10 hrs)</p>	<p>Drawing paper- Types of drawing papers; its uses and care.</p>
19	-Do-	<p>45. Enlarge &amp; Sketching Cinema Posters. (05 hrs)</p> <p>46. Colouring enlarged Cinema Poster. (20 hrs)</p>	<p>Knife-Uses; different types of Putty knife; Scraper knife; hacking knife; Diamond-glazier; Gilder knife; Shave hook knife; Stencil knife; Chisel knife.</p>
20-21	Demonstrate with colour shades different types letters (Devanagari, roman, gothic, Text writing/lettering.) and apply them in appropriate place.	<p>47. Sketching &amp; coloring gothic letters in English. (10 hrs)</p> <p>48. Sketching &amp; coloring gothic letters in Mother Language. (10 hrs)</p> <p>49. Sketching &amp; coloring Roman letters. (09 hrs)</p> <p>50. Do free hand boru Strokes Devnagri. (08 hrs)</p> <p>51. Sketching &amp; colouring Devnagri letters. (08 hrs)</p> <p>52. Sketching &amp; colouring Text or Italic letters. (05 hrs)</p>	<p>Lettering- Description; uses of devnagri, Roman, Gothic; Italic and Text writing. Spacing - Mechanic and Optical spacing.</p>
22-23	<p><b>Project Work</b> Broad areas: a) Hand Made Greetings. b) Decorative Envelops Making. c) Decorative &amp; Painted Paper Hand Bags Making.</p>		
24-25	<b>Revision</b>		
26	<b>Examination</b>		

**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 in a group (Group of at least 4 trainees). The group should demonstrate Planning, Execution, Contribution and Application of Learning. They need to submit 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.*



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## SYLLABUS FOR PAINTER (GENERAL) TRADE

### SECOND SEMESTER – 06 Months

Week No.	Ref. Learning Outcome	Professional Skills (Trade Practical) With Indicative Hours	Professional Knowledge (Trade Theory)
27-29	Plan and organize the work to make job as per specification applying different types of basic operation. <i>[Basic fitting operation – marking, Chiselling, Filing, Drilling, Pipe fitting]</i>	<p><b>CARPENTER WORK:</b></p> <p>53. Marking Practice on wood. (07 hrs)</p> <p>54. Holding &amp; Sawing Practice different size of wood. (10 hrs)</p> <p>55. Teeth setting &amp; sharpening of different saw. (07 hrs)</p> <p>56. Trenching Half cut on wooden border. (05 hrs)</p> <p>57. Setting of planers &amp; sharpening on plane blade. (05 hrs)</p> <p>58. Plane on different wooden surfaces. (06 hrs)</p> <p>59. Chiselling slots on thick wood. (05 hrs)</p> <p>60. Drilling on wood with different drilling tools (Gimlet, Hand Drill, Portable elct. drilling machine. (05 hrs)</p> <p>61. Identify &amp; check different types of pipe. (05 hrs)</p> <p>62. Do pipe cutting &amp; threading (10 hrs)</p> <p>63. Apply different types of pipe joint/ fitting of different materials &amp; different diameter. (Use PVC pipe) (10 hrs)</p>	<p>Carpenter - safety precaution description, Use hand tools, carpenter tools, types of wood their description &amp; use common defects in timber &amp; their effects.</p> <p>Plumber: Instruction to the trade safety precautions and elementary first aid. Plumber hand tools description on rain water &amp; pipe system including installation of water supply fitting. Description of different types of pipes &amp; their use such as galvanized pipes, PVC pipes. Pipe line leakage &amp; Maintenance.</p>
30	-Do-	<p>64. Make a simple lap joint. (05 hrs)</p> <p>65. Make a simple mitred half lap joint. (05 hrs)</p> <p>66. Make a simple Dovetail joint. (05 hrs)</p> <p>67. Joint fitting with nails, screw,</p>	<p>Equipments for joint, Joints - Types and uses of different types of joints.</p>



		glue etc. (10 hrs)	
31	Manufacture simple sheet metal items as per drawing and join them by riveting. (like- Screen frame, sign board, & hanging Paintings frame)	<b>SHEET METAL WORK:</b> 68. Marking of straight lines, circles, profiles and various Geometrical shapes and cutting the sheets with snips. (15 hrs) 69. Marking out of simple development (05 hrs) 70. Marking out for flaps for joints (05 hrs)	Safety precautions to be observed in a sheet metal workshop, sheet and sizes, Shearing machine-description, parts and uses.
32	-Do-	<b>Make various joints:</b> 71. Hemming, form locked, grooved and knocked up single hem straight and curved edges form double hemming. (15 hrs) 72. Make cylindrical objects with joints. (10 hrs)	Marking and measuring tools, wing compass, Prick punch, square tools, snips, types and uses. hammers and mallets type-sheet metal tools, Soldering iron, Trammel, Stakes
33	-Do-	73. Make simple Square table tray with folding edge and fix handle with riveting. (17 hrs) 74. Make simple triangular tray with folding edge and fix handle with riveting. (08 hrs)	Marking and measuring tools, wing compass, Prick punch, square tools, snips, types and uses. hammers and mallets type-sheet metal tools, Soldering iron, Trammel, Stakes
34	-Do-	75. Make joint/ fitting for rain water (Use PVC pipe). (10 hrs) 76. Make joint/ fitting for water pipe line (Use GI pipe). (10 hrs) 77. Make joint/ fitting for water pipe line (Use PVC pipe). (05 hrs)	-Do-
35	Execute different types of Operating System and explore the working on DTP, Corel Draw, Photo shop etc.	78. Operate & familiarise with computer operating system. (05 hrs) 79. Operate paint software & draw freehand sketch & use like as colour bucket, eraser, pencil & all tools. (05 hrs) 80. Draw scenery like realistic in paint software (05 hrs)	Standard pipe threads, nominal diameter, wall thickness, schedule number, die & diestock, tubing.

		<b>Photoshop:</b> 81. Tool handling in photo shop. (05 hrs) 82. Familiarise with all hand. (05 hrs)	
36	-Do-	83. Make a different layer & create background, artistic text, design, images. (05 hrs) 84. Import photo image from file & scanner, edit photo image. (05hrs) 85. Edit Image adjustment effects. & layer style effects. (05 hrs) 86. Edit special effect on different layer, colours, textures, filter effects. (05 hrs) 87. Edit & Save image in PSD, JPEG & other format. (05 hrs)	-Do-
37	-Do-	88. Create a colour advertise design for festival offer. (15 hrs) 89. Export Design, image, photograph from Photoshop to other different format for different software's. & make a print & print file for different printers. (10 hrs)	-Do-
38	-Do-	<b>Corel Draw :</b> 90. Apply select /move /copy /objects, retire skew, size Objects. (05 hrs) 91. Apply Combine, Shape, weld, trim, Align, Group / Ungroup objects. (05 hrs) 92. Add text & Format text create different heading & Sub-heading. (05 hrs) 93. Draw dimensionally objects, creating special effects for backgrounds & related objects. (10 hrs.)	Drawing simple geometric objects using Corel Draw Transforming objects, Organizing objects, Working with text, Dimensioning objects Creating special effects
39	-Do-	94. Do graphical effects to text. (05 hrs) 95. Creating symbols, logo,	-Do-

		special effects. (10 hrs) 96. Make a flex design for marketing offers. Convert & Save to cd/dvd/pd for final printing. (10 hrs)	
40	Produce stencils involving different shapes in ornamental design, text, symbols etc. operations for different medium like papers, cards, tin, foam board, observing procedure and check for accuracy.	97. Create ornamental designs for stencils, cut it & make a print. (10 hrs) 98. Draw simple sentence in different lettering, stencil cutting & stencilling. (15 hrs)	Stencil -Definition and types of stencils. Uses ; Care and cleaning of different types of stencils. Instruments and equipments for stencil..
41-42	Produce Sign board, Name plate. prepare back ground painting, screen printing, Observe finishing, lettering proportion & evenness	99. Make sign board with background painting. (10 hrs) 100. Make Figure Enlargement for sign board. (10 hrs) 101. Draw and painting letters & design or logo on Sign Board (20 hrs) 102. Paint a name plate on different material (wood/ tin/ acrylic). (10 hrs)	Advertisement-Sign Board, Banner, Posters, Hoardings, Wall painting, Name plate, Logo, Symbol, Monogram, Digital Flex Board.  Graph Making & Enlargement, Need of graph for Enlargement
43-44	-Do-	103. Make a wooden frame with bolting cloth. (10 hrs) 104. Create Art work on tracing for screen exposing. (10 hrs) 105. Coating solution & expose screen with ready art work, Develop exposed screen with cold water, touch up pin holes and nonprinting area, taping around inside. (15 hrs) 106. Use cromoline film & expose screen with ready art work, Develop exposed screen with cold water, touch up pin holes and nonprinting area, taping around inside. (15 hrs)	Screen Printing - Types, definition and explanation. Origin and development of screen painting.  Selection of cloth, instruments, chemicals, cloth fitting, exposing.
45-46	-Do-	107. Prepare & registration Pining work on printing table. (05 hrs) 108. Testing of registration with squeezing ink. (02 hrs)	Screen developing; printing and de-exposing /washing. Types of ink

		<p>109. Do single colour printing on selected cards/sheets. (15 hrs)</p> <p>110. Do multi colour printing on selected cards/sheets. (25 hrs)</p> <p>111. Decorating used screen with bleach powder or decorating solution, wash &amp; clean. (03 hrs)</p>	
47-49	<p><b>Project Work</b> Broad areas:</p> <p>a) Digital Flex Chart ( Safety / Enrolment / Educational)</p> <p>b) Decorative or Advertise painting on wall.</p> <p>c) Make Greeting cards or visiting cards with screen printing.</p>		
50-51	REVISION		
52	EXAMINATION		

**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 in a group (Group of at least 4 trainees). The group should demonstrate Planning, Execution, Contribution and Application of Learning. They need to submit 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.*

## SYLLABUS FOR PAINTER (GENERAL) TRADE

### THIRD SEMESTER - 06 MONTHS

Week No.	Ref. Learning Outcome	Professional Skills (Trade Practical) With Indicative Hours	Professional Knowledge (Trade Theory)
53-54	Develop a craft work and artistic work on radium/ vinyl/ thermocol etc.	<p>112. Make a manually ornamental design on radium or vinyl. (05 hrs)</p> <p>113. Make a symbol or image design by computer in graphics &amp; cut it with plotter. (10 hrs)</p> <p>114. Do "Instruction board" on acrylic sheet with help of multi layer radium or vinyl. (13 hrs)</p> <p>115. Make a lettering/ image/ symbol design for "Instruction board" by computer in graphics, with help of radium or vinyl &amp; cutting it with plotter, pasting on glass/ acrylic/ sun mica or different sheets. (12 hrs)</p> <p>116. Create a design for wall decoration by computer in graphics &amp; cut it on multi colour vinyl, paste on wall. (10 hrs.)</p>	<p>Their use &amp; care.</p> <p>Different medium paper for plotter cutting. Manual cutting Instruments &amp; their safety/care/precautions, proper pasting procedure, pasting techniques, care &amp; precaution.</p>
55-56	Identify different types of Plywood, MDF & low-quality wood and make wooden surface used various techniques, decorate, paint & make an attractive wooden article.	<p>117. Clean, sanding, knotting, stooping, staining preparation wooden surface properly for polish. (05 hrs)</p> <p>118. Make &amp; apply putty for varnishing &amp; polishing. (05 hrs)</p> <p>119. Apply polish on prepared</p>	<p>Polish paper-Types and uses.</p> <p>Putty - Definition, their material types and uses. Method of mixing &amp; its different system of application.</p> <p>Varnish - Definition; types and characteristics of varnish. Process of making</p>

		<p>wooden surface with cotton rags. (05 hrs)</p> <p>120. Clean, sanding, knotting, stooping, staining preparation wooden surface properly for varnish. (05 hrs)</p> <p>121. Apply varnish on prepared wooden surface with brush. (05 hrs)</p> <p>122. Prepare wooden article &amp; apply varnish with spray. (08 hrs)</p> <p>123. Prepare wooden article &amp; apply melamine or PU wooden finish with spray. (08 hrs)</p> <p>124. Make a wooden top with thick layer of melamine polish. (09 hrs)</p>	<p>of varnish its importance and contains.</p> <p>Polish- Types and uses. Different application methods</p>
57	-Do-	<p>125. Prepare wooden surface properly for painting. (05 hrs)</p> <p>126. Apply wood primer by brush (05 hrs)</p> <p>127. Make putty for wood finishing. (05 hrs)</p> <p>128. Apply putty &amp; prepare wooden surface properly. (05 hrs)</p> <p>129. Do paint wooden surface properly with brush (05 hrs)</p>	<p>Paint- Definition; classification and use.</p> <p>Pigment, Binders, Solvent, oil, dryers; additives.</p> <p>Painting- Definition and importance of painting.</p>
58	-Do-	<p>130. Prepare &amp; spray painting on different furniture taking all precautions. (25 hrs)</p>	<p>Method of wooden surface painting.</p>
59-60	Develop internal and external Building painting by using different decorative press.	<p>131. Prepare ceiling surface for lime wash. (05 hrs)</p> <p>132. Prepare wall surface for lime wash. (05 hrs)</p> <p>133. Apply POP on wall for lime painting. (03 hrs)</p>	<p>Types, uses of building (wall) paints. Wall primer- Water base / Oil base, types of putty for wall. Mixing, Preparation process of Lime and Distemper . Other required</p>

		<p>134. Make &amp; mixing of lime &amp; stainer. (02 hrs)</p> <p>135. Apply Lime on ceiling &amp; wall with brush properly. (10 hrs)</p> <p>136. Prepare ceiling &amp; wall for distemper painting. (05 hrs.)</p> <p>137. Make wall putty for distemping. (02 hrs)</p> <p>138. Apply wall putty with finish &amp; prepare wall surface. (08 hrs)</p> <p>139. Mixing &amp; apply a distemper properly for wall. (10 hrs)</p>	<p>Equipments-</p> <p>Below lamp, bucket, plum-bob, putty blender, Paint strainer. Types of Trestle, ladder, scaffolding</p>
61-62	-do-	<p>140. Prepare ceiling &amp; wall surface with putty &amp; Apply interior emulsion paint. Use roller &amp; brush. (25 hrs)</p> <p>141. Prepare office &amp; work shop interior wall surface with putty, Apply enamel or luster paint. (25 hrs)</p>	<p>Colour selection for interior wall painting and use of Paints. Effects; Intention; Purpose of colors. Paint mixing and preparation process. Difference between emulsion paint and Oil paint.</p>
63-64	-do-	<p>142. Make scaffolding for exterior wall painting. (05 hrs)</p> <p>143. Clean exterior wall area with cleaning process &amp; water pressure process (05 hrs)</p> <p>144. Prepare exterior wall with white cement for painting. (08 hrs)</p> <p>145. Paint the prepared wall by brush with cement paint. (08 hrs)</p> <p>146. Prepare exterior wall with exterior priming for painting. (10 hrs)</p> <p>147. Paint the prepared wall by brush with emulsion paint.</p>	<p>Color selection for exterior wall painting and use of Paints. Method of paint mixing and preparation. Paint used for exterior wall painting.</p>



		(10 hrs) 148. Decorate the projection with dark shade apply special shades of emulsion colour. (04 hrs)	
65	-Do-	149. Decorate the wall with design roller/ stamp/ stencil. (25 hrs)	Difference between brush painting and Roller painting. Types of Roller and preparation of texture for wall painting.
66	-Do-	150. Prepare wall & create texture, use different medium, colour & make a different textures. (25 hrs)	-do-
67	-Do-	151. Prepare wall & design wall paper pasting on wall (10 hrs) 152. Find the defect on wall before painting and remove it. (08 hrs) 153. Find the defect on wall after painting and remove it. (07 hrs)	Wall defects and defects removal process of wall painting.
68	Choose different pipes as per safety aspect and apply line painting with colour code.	154. Prepare & paint by brush windows, grill, doors, safety doors, gate etc. (25 hrs)	Building Painting estimate & costing.
69	-Do-	155. Paint a ceiling and wall with dip-feed roller / pad or airless spray. (25 hrs)	-do-
70	-Do-	156. Paint the GI pipe, take all precautions while painting. (08 hrs) 157. Paint the sanitary pipe, take all precautions while painting. (08 hrs) 158. Paint the MS square & round pipe, take all precautions while painting. (09 hrs)	Intention and effects of pipe line painting, Colour Codes of pipe line painting. ISI colour code.



71	-Do-	159. Paint deferent pipe line with colour code as per ISI. (25 hrs)	-do-
72	-Do-	160. Demonstrate knowledge of safety procedures in Industrial pipe line painting (Demo by video & charts). (15 hrs) 161. Identify colour code wise– Pipe lines, different types of valves. (10 hrs)	
73-75	<b>Project Work</b> Broad areas a) Decorate exterior area (like drinking water tank, garden bench, entrance gate.) b) Make a table article by polishing. c) Draw and paint a composition or landscape on wall. d) Make a board on wall & write Inspirational Quotes.		
76-77	REVISION		
78	EXAMINATION		

**Note: -**

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2. *Instructor may design their own project and also inputs from local industry may be taken for designing such new project.*
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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.*

## SYLLABUS FOR PAINTER (GENERAL) TRADE

### FOURTH SEMESTER- 6 MONTHS

Week No.	Ref. Learning Outcome	Professional Skills (Trade Practical) With Indicative Hours	Professional Knowledge (Trade Theory)
79-80	Process of cleaning and painting on metal surface for preventive coat.	162. Scrap the corrode metal surface. (08 hrs) 163. Clean the metal surface by wire brush or orbital wire brush. (08 hrs) 164. Burn the old paint from metal surface by blow lamp or gas flame. (08 hrs) 165. Do dry sanding with help of emery paper/cloth (06 hrs) 166. Apply wet sanding on old painted object. (06 hrs) 167. Clean the metal surface by Sander machine. (06 hrs) 168. Level different metal surface by portable hand grinder. (08 hrs)	Corrosion- Definition and classification. Reasons for rusting and effect of climate. Different anti-rusting process.
81	-Do-	169. Apply degreasing process on metal surface. (05 hrs) 170. Apply de-rusting or pickling process on corrode metal. (06 hrs) 171. Treated phosphating on metal surface with all pre-treatment process. (08 hrs) 172. Demonstrate practical of Different types of , Industrial Pt system by video. (06 hrs)	Metal surface - types and selection of sanding paper (polish paper). Metal surface cleaning- Mechanical and chemical cleaning. (Dry/ wet Sanding, scraping, wire brushing, orbital wire brushing, paint burning, sand and shot- blasting, pickling and phosphating).
82	-Do-	173. Make a proper thin metal primer for brush application. (02 hrs) 174. Prepare metal surface &	Metal Primer - Types, Purpose, application and use. Types of surface. Types of solvent or reducers /

		<p>apply ready primer on metal surface by brush. (05 hrs)</p> <p>175. Apply enamel / polyester putty or filler on primed surface. (08 hrs)</p> <p>176. Apply enamel paint on primed metal surface. (10 hrs)</p>	<p>thinner/ automotive paints ( Enamel, NC, Stoving, PU, Epoxy, rubber base soundeadner paint, metallic, pearl, water base automotive paint), lacquer.</p>
83	-Do-	<p>177. Prepare and paint metallic article by brush. (15 hrs)</p> <p>178. Prepare &amp; colour making for deep painting. (01 hr)</p> <p>179. Prepare article for deep painting. (04 hrs)</p> <p>180. Demonstrate practical of Electro coat Deeping process &amp; conveyor system by video (05 hrs)</p>	<p>Types of painting process- Traditional and modern technology. Ex.- Brushing, Deeping, barreling, Aerosol, roller coating, suction spray, vertical spray, pressure vessel, spray airless, electrostatic, powder coating etc.</p>
84	Identify, replace and assemble different pneumatics and paint gun. [Different components– Compressor, Pressure Gauge, Filter Regulator, Valve for hose]	<p>181. Identify pneumatic components – Compressor, pressure gauge, Filter-Regulator-Lubricator (FRL) unit, and Different types of valves and actuators. (05 hrs)</p> <p>182. Demonstrate knowledge of safety procedures in spray systems and personal Protective Equipment (PPE) (orally &amp; video). (05 hrs)</p> <p>183. Maintenance, troubleshooting, and safety aspects of pneumatic and Painting instruments (The practical for this component may demonstrated by video)</p>	<p>Spray Gun - Principles of spray painting, spray gun accessories and their function different types of spray guns. Holding of spray gun and stroke adjustment. Types of spray painting method. Air compressor for Painting Process. Required instruments for spray painting.</p>

		(15 hrs)	
85	Perform Spray Painting technique. (Spray Gun / hose handling, air & paint pressure controlling,)	184. Knowledge & Inspect spray gun holding and stroke adjustment, Paint adjustment, air adjustment techniques. (15 hrs) 185. Spraying practice on the surface like as edges, corner, square, round & curved area. (10 hrs)	Description of spray painting plant. Types of booth, description of booth, care and maintenance of spary booth.
86	Operate the system of spray booths, Oven, cleaning & their maintenance, application of sealant component on metallic joints.	186. Operate, maintenance, troubleshooting, and safety aspects of paint spray booth. (08 hrs) 187. Operate, and safety aspects of Oven Setting, temperature & timing. (08 hrs) 188. Apply sealant on metallic joints. (09 hrs)	Types of oven for painting. Description of oven and its care. Sealant - Definition and description. Purpose of sealant application - edge protection; prevention of water leakage. (Hiding the metal joint/clinch).
87	Perform aspect ratio mixing of paint, hardner & solvent. Measure Viscosity of paint. Operate the Spray painting system.	189. Paint preparation & mixing for spray painting. (05 hrs) 190. Practice to Measure the viscosity of paint. (10 hrs) 191. Spray Painting practice on ornamental objects, with deferent types of paints. (10 hrs)	Paint viscosity - importance, method of the paint viscosity. Paint preparation & mixing for different application.
88	-Do-	192. Spraying metallic primer on metal surface. (05 hrs) 193. Apply Carpatch, Putty, Filler on metallic surface & prepare it. (10 hrs) 194. Spraying Surfacer on primed or putty finish surface. (05 hrs) 195. Spraying finish Top Coat on prepared job. (05 hrs) * Use enamel/ N.C. paints. (Or	Introduction and uses of Pressure feed, Airless and Electrostatic Spray painting.

		latest paints.)	
89	Identify and apply of spray painting in Home appliances, Agricultural equipment's, Machines, Automotive Bodies etc.	<p>196. Prepare the surface of home appliances (ex- fan, cooler, fridge, washing machine etc.). (07 hrs)</p> <p>197. Priming &amp; surfacing on home appliances. (09 hrs)</p> <p>198. Apply finish undercoat &amp; top coat on home appliances. (09 hrs)</p> <p>* Use enamel/ N.C./ P.U. paints-Solid/ Metallic/ Pearl/.</p>	-do-
90	-Do-	<p>199. Prepare the surface of machine (ex- lath, drilling, grinding, compressor, suing machine etc.). (07 hrs)</p> <p>200. Priming &amp; surfacing on machine. (09 hrs)</p> <p>201. Apply finish undercoat &amp; top coat on machine. (09 hrs)</p> <p>* Use Enamel/ Epoxy/N.C./ P.U. /paints. (Or latest paints.)</p>	Process of article and machine painting
91	-Do-	<p>202. Prepare the Tow wheeler body and spares surface. (07 hrs)</p> <p>203. Priming &amp; surfacing the Tow wheeler body and spares surface. (09 hrs)</p> <p>204. Apply finish undercoat &amp; top coat on Tow wheeler body and spares surface. (09 hrs)</p> <p>* Use Automotive paints. Apply Graphic sticker on painted surface properly &amp; apply lacquer coat evenly.</p> <p>* Use Enamel/ N.C./ P.U. paints/-Solid/ Metallic. (Or latest paints.)</p>	Car: Process of repainting. (Removal of dent, car patch, putty process, metal primer, surface, paint) Spray painting. Types of paint defects & its reamedes. Importance of polishing, removal defects by polishing,

92	-Do-	<p>205. Identify the parts of Electrostatic gun assembly &amp; operate it care fully. (08 hrs)</p> <p>206. Identify the parts of Airless gun assembly &amp; operate it care fully. (08 hrs)</p> <p>207. Demonstrate practical of Different types of Spray painting , Industrial Painting system by video. (09 hrs)</p>	-Do-
93-94	<p>Removal of dents &amp; recover the damaged accidental area. Repaint &amp; recovering damaged area.</p>	<p>208. Disassemble essential damage parts, inspect &amp; mark denting aria. Choose &amp; decide process tools for denting. (06 hrs)</p> <p>209. Removed dent on marked aria, apply essential method. (10 hrs)</p> <p>210. Do sanding or burn on denting aria &amp; apply primer &amp; surface. Apply putty layer on necessative aria evenly. (10 hrs)</p> <p>211. Use wet sanding, level denting surface aria, apply thin coat of surface. (05 hrs)</p> <p>212. Masking on unwanted aria properly. (05 hrs)</p> <p>213. Match the shade Overlay proper equally on unmask aria. (05 hrs)</p> <p>214. Unmasked the mask aria carefully &amp; checkout properly &amp; touch-up it by necessary process. (04 hrs)</p> <p>215. Apply final coat rub and wax properly &amp; matched it. (05 hrs.)</p>	<p>Removal of defects by polishing. Removal dented aria on the different surface, types of denting process.</p>

95	-Do-	<p>216. Demonstrate knowledge of Paint defects &amp; its remedies. (video). (05 hrs)</p> <p>217. Check &amp; Find out different paint defects (run down, sagging, pin hole, orange peel, oil &amp; water spot, over/dry spray, uncover shade variation etc.). (05 hrs)</p> <p>218. Mark the defected area, Decide Techniques &amp; apply remedies properly. Make Finished surface. (15 hrs)</p>	Types of paint defects & its remedies. Importance of polishing, removal defects by polishing,
96	Finish special effects for Modern furniture.	219. Process Finish special effects on different furniture & different surface. (like as-colour gradations, malty tones applying, different textures, etc.). (25 hrs)	Furniture making is a multiple skills, using different applications on one object like Painting, Polishing, Varnishing, Waxing, staining, PU coating textures creating etc.
97	Identify different types of powder coating and apply the Powder coating technique in appropriate place.	<p>220. Prepare &amp; Clean the metallic article in chemical (degreasing, de-rusting, activation, phospheting, passivation &amp; water rainssing as where required etc.). (08 hrs)</p> <p>221. Proceed powder coating on cleaned article &amp; bake it in oven in appropriate temperature &amp; timing. (17 hrs.)</p>	Operating system of Powder coating technique. Chemical cleaning process, Types of coating powders,
98	Integrate quality testing for various Paints & Painted films.	<p>222. Demonstrate knowledge of Paint defects &amp; its remedies. (video). (10 hrs)</p> <p>223. Test the quality of paints &amp; Painted surfaces by various method &amp; instruments. (15 hrs)</p>	Different types of paints & painted surface testing equipments, Types of testing methods. Use & care.
99-101	<b>Industrial Visit /Project Work</b>		

	<p>Broad areas:</p> <ul style="list-style-type: none"> <li>a) Make a Sample of different painting types of defects on metal plates.</li> <li>b) Decorate small furniture or article.</li> <li>c) Paint &amp; decorate kids Toys by spray.(ex-small cars, doll, etc.)</li> <li>d) Powder coating article like as gate lamp assembly, keychain, metallic toys.</li> </ul>
102-103	<b>Revision</b>
104	<b>Examination</b>

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## 9. SYLLABUS - CORE SKILLS

### 9.1 WORKSHOP CALCULATION SCIENCE & ENGINEERING DRAWING

S No.	Workshop Calculation and Science	Engineering Drawing
<b>First Semester</b>		
1.	<b>Unit:</b> Systems of unit- FPS, CGS, MKS/SI unit, unit of length, Mass and time, Conversion of units	Engineering Drawing: Introduction and its importance <ul style="list-style-type: none"> <li>- Relationship to other technical drawing types</li> <li>- Conventions</li> <li>- Viewing of engineering drawing sheets.</li> <li>- Method of Folding of printed Drawing Sheet as per BIS SP:46-2003</li> </ul>
2.	<b>Fractions</b> : 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 <ul style="list-style-type: none"> <li>- 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.</li> </ul>
3.	<b>Square Root</b> : Square and Square Root, method of finding out square roots, Simple problem using calculator.	Lines : <ul style="list-style-type: none"> <li>- Definition, types and applications in Drawing as per BIS SP:46-2003</li> <li>- Classification of lines (Hidden, centre, construction, Extension, Dimension, Section)</li> <li>- Drawing lines of given length (Straight, curved)</li> <li>- Drawing of parallel lines, perpendicular line</li> <li>- Methods of Division of line segment</li> </ul>
4.	<b>Ratio &amp; Proportion</b> : Simple calculation on related problems.	Drawing of Geometrical Figures: Definition, nomenclature and practice of <ul style="list-style-type: none"> <li>- Angle: Measurement and its types, method of bisecting.</li> <li>- Triangle -different types</li> <li>- Rectangle, Square, Rhombus,</li> </ul>

		<p>Parallelogram.</p> <ul style="list-style-type: none"> <li>- Circle and its elements.</li> </ul>
5.	<b>Percentage</b> : Introduction, Simple calculation. Changing percentage to decimal and fraction and vice-versa.	<p>Lettering and Numbering as per BIS SP46-2003:</p> <ul style="list-style-type: none"> <li>- Single Stroke, Double Stroke, inclined, Upper case and Lower case.</li> </ul>
6.	<b>Material Science</b> : 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 metals, Non-Ferrous Alloys.	<p>Dimensioning:</p> <ul style="list-style-type: none"> <li>- Definition, types and methods of dimensioning (functional, non-functional and auxiliary)</li> <li>- Types of arrowhead</li> <li>- Leader Line with text</li> </ul>
7.	<b>Mass, Weight and Density</b> : Mass, Unit of Mass, Weight, difference between mass and weight, Density, unit of density, specific gravity of metals.	<p>Free hand drawing of</p> <ul style="list-style-type: none"> <li>- Lines, polygons, ellipse, etc.</li> <li>- geometrical figures and blocks with dimension</li> <li>- Transferring measurement from the given object to the free hand sketches.</li> </ul>
8.	<b>Speed and Velocity</b> : Rest and motion, speed, velocity, difference between speed and velocity, acceleration, retardation, equations of motions, simple related problems.	<p>Sizes and Layout of Drawing Sheets</p> <ul style="list-style-type: none"> <li>- Basic principle of Sheet Size</li> <li>- Designation of sizes</li> <li>- Selection of sizes</li> <li>- Title Block, its position and content</li> <li>- Borders and Frames (Orientation marks and graduations)</li> <li>- Grid Reference</li> <li>- Item Reference on Drawing Sheet (Item List)</li> </ul>
9.	<b>Work, Power and Energy</b> : 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.	<p>Method of presentation of Engineering Drawing</p> <ul style="list-style-type: none"> <li>- Pictorial View</li> <li>- Orthogonal View</li> <li>- Isometric view</li> </ul>
10.	-----	<p>Symbolic Representation (as per BIS SP:46-2003) of :</p> <ul style="list-style-type: none"> <li>- Fastener (Rivets, Bolts and Nuts)</li> <li>- Bars and profile sections</li> </ul>

		<ul style="list-style-type: none"> <li>- Weld, brazed and soldered joints.</li> <li>- Electrical and electronics element</li> <li>- Piping joints and fittings</li> </ul>
<b>Second Semester</b>		
1.	<p><b>Algebra</b> : Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).</p>	Construction of Scales and diagonal scale
2.	<p><b>Mensuration</b> : Area and perimeter of square, rectangle, parallelogram, triangle, circle, semi circle,</p> <p>Volume of solids – cube, cuboids, cylinder and Sphere.</p> <p>Surface area of solids – cube, cuboids, cylinder and Sphere.</p>	Practice of Lettering and Title Block
3.	<p><b>Trigonometry</b>: Trigonometrical ratios, measurement of angles.</p> <p>Trigonometric tables</p>	<p>Dimensioning practice:</p> <ul style="list-style-type: none"> <li>- Position of dimensioning (unidirectional, aligned, oblique as per BIS SP:46-2003)</li> <li>- Symbols preceding the value of dimension and dimensional tolerance.</li> <li>- Text of dimension of repeated features, equidistance elements, circumferential objects.</li> </ul>
4.	<p><b>Heat &amp; Temperature</b>: 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, transmission of heat, conduction, convection, radiation.</p>	<p>Construction of Geometrical Drawing Figures:</p> <ul style="list-style-type: none"> <li>- Different Polygons and their values of included angles. Inscribed and Circumscribed polygons.</li> <li>- Conic Sections (Ellipse &amp; Parabola)</li> </ul>
5.	<p><b>Basic Electricity</b>: Introduction, use of electricity, how electricity is produced, Types of current_ AC, DC, their comparison, voltage, resistance, their units. Conductor, insulator, Types of</p>	Drawing of Solid figures (Cube, Cuboids, Cone, Prism, Pyramid, Frustum of Cone and Pyramid.) with dimensions.

	connections – series, parallel, electric power, Horse power, energy, unit of electrical energy.	
6.	<p><b>Levers and Simple Machines:</b> levers and its types.</p> <p>Simple Machines, Effort and Load, Mechanical Advantage, Velocity Ratio, Efficiency of machine, Relationship between Efficiency, velocity ratio and Mechanical Advantage.</p>	Free Hand sketch of hand tools and measuring tools used in respective trades.
7.	-	<p>Projections:</p> <ul style="list-style-type: none"> <li>- Concept of axes plane and quadrant.</li> <li>- Orthographic projections</li> <li>- Method of first angle and third angle projections (definition and difference)</li> <li>- Symbol of 1<sup>st</sup> angle and 3<sup>rd</sup> angle projection as per IS specification.</li> </ul>
8.	-	Drawing of Orthographic projection from isometric/3D view of blocks
9.	-	Orthographic Drawing of simple fastener (Rivet, Bolts, Nuts & Screw)
10.	-	Drawing details of two simple mating blocks and assembled view.
<b>Third Semester</b>		
1.	Motion:- Problems on Laws of motion and velocity.	Projection – Introduction, principle, method of projection. Difference between third angle & first angle projection.
2.	Units of volume. Calculations related to volume, unit conversions. Calculations on relation between volume, mass and density.	Draw orthographic projections in III angle (simple to complex components).
3.	Definition of specific gravity. Density and relative density. Calculation of density of a body.	Freehand isometric sketching from orthographic views.

4.	Heat treatment of steels hardening, annealing, tempering, normalizing, case hardening, standards and Measurement.	Constructions of simple curves of inter penetration objects.
5.	Calculate the surface area of chair, table, windows, doors, walls, floors for painting. Calculate the area of different shape of regular and irregular object. Calculate the cost of painting material cost and labour cost.	Development of surface of simple objects.
6.	-----	Freehand sketching of different types of welded joints related to the trade.
7.	-----	Freehand sketching of different pipe joint & flanged joints.
8.	-----	Freehand sketching of different shaft couplings with keys.
<b>Fourth Semester</b>		
1.	Simple problems on profit and loss. Simple and compound interest.	Free-hand sketching of simple objects related to the trade & preparation of simple working drawings from the sketches.
2.	Indices: Laws of indices related problems. Quadratic Equation: Introduction, solution of simple Quadratic equation and related problems.	Freehand sketching of simple assembled parts with colour.
3.	Friction –definitions, its effect & types. Laws of friction. Advantage and disadvantage of friction.	Drawing of different pipe lines and paint as per colour code.
4.	Moment and lever –Moments, unit, arm of couple, Principal of Moment, moment of couple, lever, tongue. Centre of Gravity.	Freehand sketching of different machine bodies and paint as per colour code.
5.	Magnetism: Magnetic material, magnetic field, flux density, magnetic moment, m.m.f. Reluctance, permeability, susceptibility, electromagnet, solenoid and its practical applications.	Freehand sketching of car body and colour shading practice.
6.	Preparation of simple estimation:- Estimation of labour charges for various	Freehand sketching of building (interior & exterior)

	painting jobs	
7.	-----	Freehand sketching of building practice of different colour shading.
8.	-----	Freehand sketching of building (interior & exterior) and practice of different colour shading.



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## 9.2 EMPLOYABILITY SKILLS

CORE SKILL – EMPLOYABILITY SKILL	
First Semester	
<b>1. English Literacy</b>	<b>Duration : 20 Hrs. Marks : 09</b>
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 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.
<b>2. IT Literacy</b>	<b>Duration : 20 Hrs. Marks : 09</b>
Basics of Computer	Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.
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.
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.
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, 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.
<b>3. Communication Skills</b>	
<b>Duration : 15 Hrs.</b> <b>Marks : 07</b>	
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.
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
<b>Second Semester</b>	



<b>4. Entrepreneurship Skills</b>		<b>Duration : 15 Hrs.</b> <b>Marks : 06</b>
Concept of Entrepreneurship	Entrepreneur - 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.	
Project Preparation & Marketing analysis	Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of PLC, Sales & distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.	
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.	
Investment Procurement	Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.	
<b>5. Productivity</b>		<b>Duration : 10 Hrs.</b> <b>Marks : 05</b>
Benefits	Personal / Workman - Incentive, Production linked Bonus, Improvement in living standard.	
Affecting Factors	Skills, Working Aids, Automation, Environment, Motivation - How improves or slows down.	
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.	
<b>6. Occupational Safety, Health and Environment Education</b>		<b>Duration : 15 Hrs.</b> <b>Marks : 06</b>
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 hygienic, 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.
<b>7. Labour Welfare Legislation</b>	
<b>Duration : 05 Hrs.</b> <b>Marks : 03</b>	
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.
<b>8. Quality Tools</b>	
<b>Duration : 10 Hrs.</b> <b>Marks : 05</b>	
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 House-keeping, Practice of good Housekeeping.
Quality Tools	Basic quality tools with a few examples.

<b>LIST OF TOOLS &amp; EQUIPMENTS</b>			
<b>PAINTER (GENERAL)</b>			
<b>S No.</b>	<b>Name of the Tools and Equipment</b>	<b>Specification</b>	<b>Quantity</b>
<b>A. TRAINEES TOOL KIT ( For each additional unit trainees tool kit Sl No. 1-8 is required additionally)</b>			
1.	Rule steel	24"	16 Nos.
2.	Drawing Board	Imperial size	16 Nos.
3.	Rule wooden (Consumable)	24"	16 Nos.
4.	Brush Round Short Hair- (Consumable)	0 to 12 No.	16 set
5.	Brush Flat Short Hair - (Consumable)	0 to 12 No.	16 set
6.	Varnish Brush soft hair- (Consumable)	25mm, 50mm, 75mm, 100mm	16 each
7.	Colour Pallet for water colour (Consumable)	Big size	16 Nos.
8.	Stencil/ Paper Cutter (Consumable)	medium size	16 Nos.
<b>B. SHOP TOOLS, INSTRUMENTS – For 2 (1+1) units no additional items are required</b>			
<b>Lists of Tools and Equipments:</b>			
9.	T' Square	Imperial size	2 Nos.
10.	Easel 'a' Type stand		2 Nos.
11.	Square Blade	150 mm	1 Nos.
12.	Scriber		5 Nos.
13.	Marking Gauge		1 Nos.
14.	Wing Compass	254 mm or 300 mm	5 Nos.
15.	Hand saw	450 mm	5 Nos.
16.	Tendon Saw	300 mm	1 Nos.
17.	Hack Saw with Frame		5 Nos.
18.	Smoothing Plane		1 Nos.
19.	Jack Plane		1 Nos.
20.	Mallet Round		5 Nos.
21.	Carpenter Hammer (Ball Pin)		2 Nos.
22.	Hammer (Crass Pin)		2 Nos.
23.	Hammer (Claw)		2 Nos.
24.	Portable Electric Hand Drill Machine		1 Nos.

25.	Drill Bits (Consumable)	3 mm, 5mm, 8mm, 10mm, 12mm	1each
26.	Chisel Knife-	5mm, 8mm, 10mm, 20mm, 30mm	1each
27.	Hacking Knife		1 Nos.
28.	Palate Knife Set		5sets
29.	Diamond Glazier Knife		1 Nos.
30.	Paint Tin Opener		2 Nos.
31.	Scraper Knife		5 Nos.
32.	Shave Huck Knife		1 Nos.
33.	Glider Knife		5 Nos.
34.	Pliers Insulated		1 Nos.
35.	Paint Burner (Acetylene Gas)		1Set
36.	Blow Lamp		2 Nos.
37.	Screw Driver	100mm / 200mm	2 each
38.	Step Ladder (Aluminum)	6 feet	2 Nos.
39.	Scaffolding (Movable)	H 2000mm x W 1400mm x L 2000mm.	1 Nos.
40.	working Bench	240 cm X 120 cm X 75 cm	1 Nos.
41.	Bench Vice	125mm	2 Nos.
42.	Weight Per Litter Cup	100 ml capacity	1 Nos.
43.	Ford Cop for Viscosity Measurement with stand	No.3 & No.4	2 each
44.	Mild Steel Panels	300 mm X 200 mm (18 X 22 SWG)	16 Nos.
45.	Sink (Stainless steel)	H 250mm x W 450mm x L 600mm.	4 Nos.
46.	Fire Extinguisher		2 Nos.
47.	Fire Buckets with stand (4 in 1)		1 set
48.	Suction feed spray gun with accessories.	1 Ltr. Capacity of cup	2 Nos.
49.	Portable Electric Hand Grinder		1 Nos.
50.	Glosso Meter		1 Nos.
51.	Infra red lamp		2 Nos.
52.	Digital DFT meter		2 Nos.
53.	Orbital Sander Machine with dust collector		5 Nos.
54.	Aerograph (Air Brush/ Pen Gun)		1 Nos.
55.	Pneumatic Polishing Machine with Pads		5 Nos.
56.	Goggles (Consumable)		5 Nos.
57.	Face Mask & Respirator (Consumable)		5 Nos.
58.	Gloves (Rubber) (Consumable)		5 Nos.

59.	Pipe vice		2 Nos.
60.	Hacksaw		2 Nos.
61.	Pipe wrench	10" & 16"	2 Nos. each
62.	flat file- smooth finish	12"	2 Nos.
63.	Circular cut file	12"	2 Nos.
64.	Raft cut	12"	2 Nos.
65.	Pipe die set metric & Inches	find peach	1 Set
66.	Gun Spray with Gravity Feed Cup with Complete accessories	with Complete accessories (Capacity- ¼ ltr. , 1/2 ltr. , 1/3ltr. , 1 ltr. )	2 Nos. each
67.	Conventional Spray Gun For Pressure Feed	with Complete accessories	2 Nos.
68.	Electric spray gun	with Complete accessories	1 Nos.
69.	Comb Gauge		2 Nos.
70.	Pencil Hardness Tester		2 Nos.
71.	Digital Weight Machine	Capacity 5 kg. weighing scale	1 No.

### C. GENERAL INSTALLATION

72.	Air Compressor	3 Phase, 2 HP	1 Nos.
73.	Air Compressor	single Phase, 1 HP	1 Nos.
74.	Pressure Feed Container with Conventional	20 ltr. Capacity with Complete accessories	1 set
75.	Electrostatic spray Gun unit	with complete accessories	1 set
76.	Airless Spray Gun unit	with complete accessories	1 set
77.	Sealer Drum Press Pump with Sealer Gun Assembly	with complete accessories	1 set
78.	Side Draught Dry Paint Booth- Overall Dimensions (mm):	1580(W) x 2250(D) x 3200(H); Working Dimensions (mm): 1500(W) x 1320(D) x 2040(H)	1 Nos.
79.	Power Coating set up with Gun booth & Oven		1 Unit

### D. Shop Floor Furniture and Materials - For 2 (1+1) units no additional items are required.

80.	Stool		16 Nos.
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81.	Desk with Locker		16 Nos.
82.	Metal Shelving Rack Open Type	1800 x 900 x 500 mm with 4 Adjustable Shelves	2 Nos.
83.	Steel Locker's with 8 Drawer's	One locker for each trainee	3 Nos.
84.	Green Glass Board	6'X4'	1 Nos.
85.	Cupboard		4 Nos.
86.	Instructor table and		1 No.
87.	Instructor chair		2 Nos.
<b>Designing Lab</b>			
88.	Computer's with Accessories (Table & Chair)		5 set each
89.	Anti Virus (Latest Version)		5 Nos.
90.	Scanner High Resolution		1 Nos.
91.	Printer Lager/colour		1 Nos.
92.	Software Card Draw / Page Make/ Photo Shop / Shree Lippi / ISM / Acee - Dcee Viewer (Latest Version)		1 Each (Multi installer)
93.	UPS	3 KV	1 Nos.
94.	Camera Digital -	12 pix (Nikon) with Try - Pod	1 Nos.
95.	Radium Plotter and cutter with stand	complete accessories 48"	1 Nos.

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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.



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**FORMAT FOR INTERNAL ASSESSMENT**

<b>Name &amp; Address of the Assessor:</b>						<b>Year of Enrollment:</b>								
<b>Name &amp; Address of ITI (Govt./Pvt.) :</b>						<b>Date of Assessment:</b>								
<b>Name &amp; Address of the Industry:</b>						<b>Assessment location: Industry / ITI</b>								
<b>Trade Name:</b>			<b>Semester:</b>			<b>Duration of the Trade/course:</b>								
<b>Learning Outcome:</b>														
S No	Maximum Marks (Total 100 Marks)		15	5	10	5	10	10	5	10	15	15	Total Internal Assessment Marks	Result (Y/N)
	Candidate Name	Father's/Mother's Name	Safety Consciousness	Workplace Hygiene	Attendance/Punctuality	Ability to follow Manuals/ Written Instructions	Application of Knowledge	Skills to Handle Tools & Equipment	Economical Use of Materials	Speed in Doing Work	Quality in Workmanship	VIVA		
1														
2														