



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

COMPETENCY BASED CURRICULUM

INDUSTRIAL PAINTER

(Duration: One Year)
Revised in July 2022

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 3



SECTOR – CONSTRUCTION



Directorate General of Training

INDUSTRIAL PAINTER

(Engineering Trade)

(Revised in Jul 2022)

Version: 2.0

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL - 3

Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

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1. COURSE INFORMATION

During the one-year duration of “Industrial Painter” trade, a candidate is trained on professional skills & knowledge and Employability skill related to job role. In addition to this a candidate is entrusted to undertake project work and extracurricular activities to build up confidence. The Broad components covered during the course are given below: -

The trainees will recognize and comply safe working practices with PPE and MSDS. They will also learn hazard and non-hazard items, uses of firefighting equipment. They will also go through the allied training on carpenter, welding, sheet metal work. Preparation of different types of wooden surface and painting on it. Knowledge of pipelines procedure and safety aspect. They will also practice graphics-stickers pasting, fixing, locking on wooden or metal surface.

The trainees will learn process of cleaning and painting on metal surface for preventive coating. Repair and maintenance of different pneumatics and paint gun. Practice on spray painting technique. Learn the aspect ratio mixing of paint, hardner and solvent. During the training they will also practice removal of dents and recover the damaged accidental area. They also practice on special effects for modern furniture. Operating system of powder coating technique and also quality test 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 economy/ Labour market. The vocational training programmes are delivered under the aegis of Directorate General of Training (DGT). Craftsman Training Scheme (CTS) with variants and Apprenticeship Training Scheme (ATS) are two pioneer schemes of DGT for strengthening vocational training.

Industrial Painter trade under CTS is one of the popular courses delivered nationwide through a network of ITIs. The course is of one-year duration. It mainly consists of Domain area and Core area. The Domain area (Trade Theory & Practical) imparts professional skills and knowledge, while Core area (Employability Skills) imparts requisite core skill, knowledge and life skills. After passing out of the training programme, the trainee is awarded National Trade Certificate (NTC) by DGT which is recognized worldwide.

Trainee broadly needs to demonstrate that they are able to:

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

2.2 PROGRESSION PATHWAYS

- Can join industry as Industrial Painter and will progress further as Senior Painter, Supervisor and can rise up to the level of Manager.
- Can become Entrepreneur in the related field.
- Can join the apprenticeship program 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.
- Can join Advanced Diploma (Vocational) courses under DGT as applicable.

2.3 COURSE STRUCTURE

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

S No.	Course Element	Notional Training Hours
1	Professional Skill (Trade Practical)	840
2	Professional Knowledge (Trade Theory)	240
3	Employability Skills	120
	Total	1200

Every year 150 hours of mandatory OJT (On the Job Training) at nearby industry, wherever not available then group project is mandatory.

4	On the Job Training (OJT)/ Group Project	150
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Trainees of one-year or two-year trade can also opt for optional courses of up to 240 hours in each year for 10th/ 12th class certificate along with ITI certification or add on short term courses.

2.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of course through formative assessment and at the end of the training programme through summative assessment as notified by the DGT from time to time.

a) The **Continuous Assessment** (Internal) 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 formative assessment template provided on www.bharatskills.gov.in

b) The final assessment will be in the form of summative assessment. The All India Trade Test for awarding NTC will be conducted by Controller of examinations, DGT as per the guidelines. The pattern and marking structure is being notified by DGT 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

For the purposes of determining the overall result, weightage of 100% is applied for six months and one year duration courses and 50% weightage is applied to each examination for two years courses. The minimum pass percent for Trade Practical and Formative assessment is 60% & for all other subjects is 33%.

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 some of 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
- Computer based multiple choice question examination
- Practical Examination

Evidences and records of internal (Formative) assessments are to be preserved until forthcoming examination for audit and verification by examining body. The following marking pattern to be adopted for formative assessment:

Performance Level	Evidence
(a) Marks in the range of 60%-75% to be allotted during assessment	
For performance in this grade, the candidate should produce work which	<ul style="list-style-type: none"> • Demonstration of good skill in the use of

<p>demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices</p>	<p>hand tools, machine tools and workshop equipment.</p> <ul style="list-style-type: none"> • 60-70% accuracy achieved while undertaking different work with those demanded by the component/job. • A fairly good level of neatness and consistency in the finish. • Occasional support in completing the project/job.
<p>(b) Marks in the range of 75%-90% to be allotted during assessment</p>	
<p>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</p>	<ul style="list-style-type: none"> • Good skill levels in the use of hand tools, machine tools and workshop equipment. • 70-80% accuracy achieved while undertaking different work with those demanded by the component/job. • A good level of neatness and consistency in the finish. • Little support in completing the project/job.
<p>(c) Marks in the range of more than 90% to be allotted during assessment</p>	
<p>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.</p>	<ul style="list-style-type: none"> • High skill levels in the use of hand tools, machine tools and workshop equipment. • Above 80% accuracy achieved while undertaking different work with those demanded by the component/job. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.

3. JOB ROLE

Painter, Industrial; applies paint, varnish and similar materials to building and other structure. Chooses the right paint or finish for the surface to be covered taking in to account durability, ease of handling, method of application and customers' wishes. Prepares surface to be covered using scrappers, abrasives, and chemical removers so that paint adheres properly. Removes old coat by stripping, sanding, wire brushing, burning or watering and abrasive blasting. May wash surfaces and do trimming to remove dirt and grease from surfaces; fills holes and cracks; welds; sand-papers rough spots and brushes off dust. Applies primer on new surfaces for the finish coat. Mixes paint and matches colours by stirring together proper portions of pigments, oil, thinner etc. and other substances relying on knowledge of paint composition and colour harmony. Chooses the right paint applicator for each job, depending on the surface to be covered; characteristics of the finish and other factors. May use brush with soft tapered edge, or paint sprayer. Puts coating liquid in to spray gun tank, couples gun to air hose and adjusts air pressure valves and nozzles when working with sprayer.

Reference NCO-2015:

- (i) 7131.0300 -Painter, Industrial

Reference NOS: -

- | | |
|-----------------|------------------|
| i) PCS/N5004 | xi) PCS/N9407 |
| ii) PCS/N5110 | xii) PCS/N9408 |
| iii) PCS/N5111 | xiii) PCS/N9409 |
| iv) PCS/N5109 | xiv) PCS/N9410 |
| v) PCS/N9401 | xv) PCS/N9411 |
| vi) PCS/N9402 | xvi) PCS/N9412 |
| vii) PCS/N9403 | xvii) PCS/N9413 |
| viii) PCS/N9404 | xviii) PCS/N9414 |
| ix) PCS/N9405 | xix) PCS/N9415 |
| x) PCS/N9406 | |
| xx) PCS/N9416 | xxiii) PCS/N9419 |
| xxi) PCS/N9417 | xxiv) PCS/N9420 |
| xxii) PCS/N9418 | |

4. GENERAL INFORMATION

Name of the Trade	INDUSTRIAL PAINTER
Trade Code	DGT/1078
NCO - 2015	7131.0300
NOS Covered	PCS/N5004, PCS/N5110, PCS/N5111, PCS/N5109, PCS/N9401, PCS/N9402, PCS/N9403, PCS/N9404, PCS/N9405, PCS/N9406, PCS/N9407, PCS/N9408, PCS/N9409, PCS/N9410, PCS/N9411, PCS/N9412, PCS/N9413, PCS/N9414, PCS/N9415, PCS/N9416, PCS/N9417, PCS/N9418, PCS/N9419, PCS/N9420
NSQF Level	Level-3
Duration of Craftsmen Training (Instructional Hours)	One Years (1200 hours + 150 hours OJT/Group Project)
Entry Qualification	Passed 10 th class examination or its equivalent
Minimum Age	14 years as on first day of academic session.
Eligibility for PwD	LD, CP, LC, DW, AA, LV, DEAF, HH, AUTISM, ID, SLD, MI
Unit Strength (No. Of Student)	24 (There is no separate provision of supernumerary seats)
Space Norms	80 Sq. m
Power Norms	2.5 KW
Instructors Qualification for	
(i) Industrial Painter Trade	<p>B.Voc/Degree in Paint Technology/ Bachelor of fine arts from AICTE/UGC recognized Engineering College/ university with one year experience in the relevant field.</p> <p style="text-align: center;">OR</p> <p>03 years Diploma in Paint technology/Painting from AICTE/ recognized board of technical education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in the relevant field.</p> <p style="text-align: center;">OR</p> <p>NTC/NAC passed in the Trade of "Industrial Painter" with three years' experience in the relevant field.</p> <p>Essential Qualification: Relevant Regular / RPL variants of National Craft Instructor Certificate (NCIC) under DGT.</p> <p>Note: - Out of two Instructors required for the unit of 2(1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications. However, both of them must possess NCIC in any of its variants.</p>
(ii) Workshop Calculation &	B.Voc/Degree in Engineering from AICTE/UGC recognized

<p>Science</p>	<p>Engineering College/ university with one-year experience in the relevant field.</p> <p style="text-align: center;">OR</p> <p>03 years Diploma in Engineering from AICTE/ recognized board of technical education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in the relevant field.</p> <p style="text-align: center;">OR</p> <p>NTC/ NAC in any one of the engineering trades with three years' experience.</p> <p><u>Essential Qualification:</u> National Craft Instructor Certificate (NCIC) in relevant trade</p> <p style="text-align: center;">OR</p> <p>NCIC in RoDA or any of its variants under DGT</p>
<p>(iii) Engineering Drawing</p>	<p>B.Voc/Degree in Engineering from AICTE/UGC recognized Engineering College/ university with one-year experience in the relevant field.</p> <p style="text-align: center;">OR</p> <p>03 years Diploma in Engineering from AICTE/ recognized board of technical education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in the relevant field.</p> <p style="text-align: center;">OR</p> <p>NTC/ NAC in any of the engineering trades with three years experience.</p> <p><u>Essential Qualification:</u> National Craft Instructor Certificate (NCIC) in relevant trade</p> <p style="text-align: center;">OR</p> <p>NCIC in RoDA / D'man (Mech /civil) or any of its variants under DGT.</p>
<p>(iv) Employability Skill</p>	<p>MBA/ BBA / Any Graduate/ Diploma in any discipline with Two years' experience with short term ToT Course in Employability Skills.</p> <p>(Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above)</p> <p style="text-align: center;">OR</p> <p>Existing Social Studies Instructors in ITIs with short term ToT Course in Employability Skills.</p>
<p>(v) Minimum Age for Instructor</p>	<p>21 Years</p>
<p>List of Tools and Equipment</p>	<p>As per Annexure – I</p>

5. LEARNING OUTCOME

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

5.1 LEARNING OUTCOMES

1. Perform Marking, sawing, planning, Chiseling, Drilling following safety precautions. (NOS: PCS/N9401)
2. Make various types of joints for different frames (like- Screen frame, sign board, & hanging Paintings frames) (NOS: PCS/N9402)
3. Manufacture simple sheet metal items as per drawing and join them. (NOS: PCS/N9403)
4. Manufacture simple sheet metal items as per drawing and join them by soldering, brazing and riveting. (NOS: PCS/N9404)
5. Explain and make various pipe fittings. (NOS: PCS/N9405)
6. Join metal component by arc welding observing standard procedure. (NOS: PCS/N9406)
7. Cut and join metal component by gas (oxy-acetylene) (NOS: PCS/N9407)
8. Join metal components by riveting observing standard procedure. (NOS: PCS/N9408)
9. Prepare wooden surface using various techniques; decorate & make attractive wooden articles. (NOS: PCS/N5004)
10. Prepare different types of wooden surface (Like Plywood, MDF & low quality wood) & paint it. (NOS: PCS/N5004)
11. Process on pipes & pipe line painting with colour code. (NOS: PCS/N5110, PCS/N5111)
12. Demonstrate pipelines procedure & safety aspect. (NOS: PCS/N9409)
13. Perform Graphics-Stickers pasting, fixing, locking on wooden or metal surface. (NOS: PCS/N9410)
14. Demonstrate process of cleaning on metal surface for preventive coat. (NOS: PCS/N5110)
15. Demonstrate process of painting on metal surface for preventive coat. (NOS: PCS/N5111)
16. Identify, replace and assemble different pneumatics and paint gun. [Different components – Compressor, Pressure Gauge, Filter Regulator. Valve for hose] (NOS: PCS/N9411)
17. Perform Spray Painting technique. (Spray Gun / hose handling, air & paint pressure controlling. (NOS: PCS/N9412)
18. Demonstrate operating system of spray booths, Oven, cleaning & their maintenance, application of sealant component on metallic joints. (NOS: PCS/N9413)
19. Perform aspect ratio mixing of paint, hardener & solvent. Measure Viscosity of paint. Operate the Spray painting system. (NOS: PCS/N5109)

20. Develop spray painting in Home appliances, Agricultural equipment's, Machines, Automotive Bodies etc. (NOS: PCS/N9414)
21. Remove dents & recover the damaged accidental area. Repaint & recover damaged area. Remedies of paint defects. (NOS: PCS/N9415)
22. Apply Finish special effects for Modern furniture. (NOS: PCS/N9416)
23. Apply Operating system of Powder coating technique. (NOS: PCS/N9417)
24. Perform Quality Testing for various paints & Painted films. (NOS: PCS/N9418)
25. Read and apply engineering drawing for different application in the field of work. (NOS: PCS/N9419)
26. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study. (NOS: PCS/N9420)

6. ASSESSMENT CRITERIA

LEARNING OUTCOMES	ASSESSMENT CRITERIA
1. Perform Marking, sawing, planing, Chiselling, Drilling following safety precautions. (NOS: PCS/N9401)	Marking Practice on wood.
	Apply holding & sawing practice on different size of wood.
	Work on teeth setting & sharpening of different saw.
	Apply tenoning Half cut on wooden border.
	Make setting of planers & sharpening on plane blade.
	Do plane on different wooden surfaces.
	Do chiseling slots on thick wood.
2. Make various types of joints for different frames (like- Screen frame, sign board, & hanging Paintings frames). (NOS: PCS/N9402)	Drilling on wood with different drilling tools (Gimlet, Hand Drill, Portable elect. drilling machine).
	Make a simple lap joint.
	Make a simple mitred half lap joint.
	Make a simple Dovetail joint.
3. Manufacture simple sheet metal items as per drawing and join them. (NOS: PCS/N9403)	Apply Joint fitting with nails, screw, glue etc.
	Marking practice of straight lines, circles, profiles and various geometrical shapes.
	Cutting practice of straight lines, circles, profiles and various geometrical shapes on sheets with snips.
	Marking out of simple development.
4. Manufacture simple sheet metal items as per drawing and join them by soldering, brazing and riveting. (NOS: PCS/N9404)	Marking out for fold for joints.
	Make the joint of hemming, form locked.
	Make the joint of grooved and knocked up single hem.
	Make the joint of straight and curved edges form double hemming.
5. Explain and make various pipe fittings. (NOS: PCS/N9405)	Make cylindrical objects with joints.
	Identify & check different types of pipe.
	Do pipe cutting & threading
	Apply different types of pipe joint/ fitting of different materials & different diameter. (Use PVC pipe)
	Make joint/ fitting for rain water (Use PVC pipe)
6. Join metal component by arc welding observing standard procedure.	Make joint/ fitting for water pipe line (Use GI pipe)
	Make joint/ fitting for water pipe line (Use PVC pipe)

(NOS: PCS/N9406)	Observe safety/ precaution during operation.
	Select appropriate material & plan for arc welding
	Weld metal parts / mechanical components as per specification observing standard procedure.
	Check joined part portion to ascertain proper welding.
7. Cut and join metal component by gas (oxy-acetylene) (NOS: PCS/N9407)	Identify different components/parts of Gas (oxy-acetylene) machine, collect desired information and set each components/parts as per standard procedure.
	Observe safety/ precaution during operation.
	Select appropriate material & plan for gas cutting & joining operation.
	Cut & join metal parts / mechanical components as per specification observing standard procedure.
	Check cut portion/ joined part to ascertain proper welding
8. Join metal components by riveting observing standard procedure. (NOS: PCS/N9408)	Mark and develop various forms as per drawing using sheet metals.
	Prepare the job for lap and butt joint.
9. Prepare wooden surface using various techniques, decorate & make an attractive wooden article. (NOS: PCS/N5004)	Apply Cleaning, sanding, knotting, stooping, staining preparation on wooden surface properly for polish.
	Make & apply putty for varnishing & polishing.
	Apply polish on prepared wooden surface with cotton rags.
	Apply Cleaning, sanding, knotting, stooping, staining preparation wooden surface properly for varnish.
	Apply varnish on prepared wooden surface with brush.
	Prepare wooden article & apply varnish with spray.
	Prepare wooden article & apply melamine or PU wooden finish with spray.
Make a wooden top with thick layer of melamine polish.	
10. Prepare different types of wooden surface (Like Plywood, MDF & low quality wood) & paint it. (NOS: PCS/N5004)	Prepare wooden surface properly for painting.
	Practice of applying wood primer by brush.
	Make a putty for wood finishing.
	Apply putty & prepare wooden surface properly.
	Do paint wooden surface properly with brush
11. Process on pipes & pipe line painting with colour code. (NOS: PCS/N5110,	Paint the GI pipe by brush.
	Paint the sanitary pipe of building. Take & care self precaution & safety.

PCS/N5111)	Paint the MS square & round pipe, take all precautions & safety while painting.
	Do Paint deferent pipe line with colour code as per ISI.
12. Demonstrate pipelines procedure & Safety aspect. (NOS: PCS/N9409)	Demonstrate knowledge of safety procedures in Industrial pipe line painting
	Identify colour code wise– Pipe lines, different types of valves.
13. Perform Graphics-Stickers pasting, fixing, locking on wooden or metal surface. (NOS: PCS/N9410)	Do simple graphics of radium's or vinyl.
	Selection of graphics properly and pest it on selected (wooden/Metallic) surface evenly.
	Use lacquer or varnish spray and coat layer of lamination.
14. Demonstrate process of cleaning on metal surface for preventive coat. (NOS: PCS/N5110)	Do Scrap on corrode metal surface.
	Cleaning process of metal surface by wire brush or orbital wire brush.
	Apply burn process on old paint from metal surface by blow lamp or gas flame.
	Apply dry sanding with help of emery paper/cloth.
	Apply wet sanding on old painted object.
	Clean the metal surface by Sander machine.
	Do level the different metal surface by portable hand grinder.
	Do degreasing process on metal surface.
	Apply de-rusting or pickling process on corrode metal.
Observe practical of Different types of , Industrial Painting system by video.	
15. Demonstrate process of painting on metal surface for preventive coat. (NOS: PCS/N5111)	Prepare metal surface & apply ready primer on metal surface by brush.
	Apply enamel/ polyester putty or filler on primed surface.
	Apply enamel paint on primed metal surface by brush.
	Prepare and paint metallic article by brush.
	Prepare & colour making for deep painting.
	Prepare article for deep painting. (Cleaning, rubbing, sanding.)
Explain the Electro coat Deeping process & conveyor system with all safety.	
16. Identify, replace and assemble different pneumatics and paint gun. [Different components– Compressor, Pressure Gauge, Filter Regulator.	Identify pneumatic components – Compressor, pressure gauge, Filter, Regulator, and Lubricator. Different types of valves.
	Explain the safety procedures in spray systems and personal Protective Equipment (PPE).
	Maintenance, troubleshooting, and safety aspects of pneumatic and Painting instruments.

Valve for hose] (NOS: PCS/N9411)	
17. Perform Spray Painting technique. (Spray Gun / hose handling, air & paint pressure controlling,) (NOS: PCS/N9412)	Application of spray gun holding and stroke adjustment, Paint adjustment, air adjustment techniques. Spraying practice on the surface like as edges, corner, square, round & curved area.
18. Demonstrate operating system of spray booths, Oven, cleaning & their maintenance, application of sealant component on metallic joints. (NOS: PCS/N9413)	Use and apply of paint spray booth & maintenance, troubleshooting, safety aspects. Use & Operate Oven Setting, temperature & timing. Apply sealant on metallic joints.
19. Perform aspect ratio mixing of paint, hardener & solvent. Measure Viscosity of paint. Operate the Spray painting system. (NOS: PCS/N5109)	Preparation of Paint mixing for spray painting. Measure the viscosity of paint. Spray Painting practice on ornamental objects, with different types of paints. Spraying metallic primer on metal surface. Apply Carpatch, Putty and Filler on metallic surface & preparation. Apply Surfacer on primed or putty finish surface. Spraying finish application for Top Coat. Use of enamel/ N.C. paints. (Or latest paints.)
20. Develop spray painting in Home appliances, Agricultural equipment's, Machines, Automotive Bodies etc. (NOS: PCS/N9414)	Prepare the surface of home appliances. Priming & surfacing process on home appliances. Apply finish undercoat & top coat on home appliances. Use enamel/ N.C./ P.U. paints- Solid/ Metallic/ Pearl/. Application of preparing machine surface. Priming & surfacing on machine. Application of finish undercoat & top coat on machine. Preparation of the tow wheeler body and spares surface. Priming & surfacing the Tow wheeler body and spares surface. Apply finish undercoat & top coat on Tow wheeler body and spares surface. * Use Automotive paints. Apply Graphic sticker on painted surface properly & apply lacquer coat evenly. Identify the parts of Electrostatic gun assembly & operate it carefully.

	Identify the parts of Airless gun assembly & Operate it carefully. Practice of Different types of Spray painting.
21. Remove dents & recover the damaged accidental area. Repaint & recover damaged area applying remedies of paint defects. (NOS: PCS/N9415)	Dissemble essential damage parts, inspect & mark denting area. Choose & decide process tools for denting. Removed dent on marked area, apply essential method. Do sanding or burn on denting area & apply primer & surface. Apply putty layer on spotted area evenly. Use wet sanding, level denting surface area, procedure of thin coat of Surfacer. Masking process on unwanted area properly. Match the shade Overlay proper equally on unmask area. Unmasked the mask area carefully & checkout properly & touch-up it by necessary process. Apply final coat rubbing and waxing process properly. Demonstrate of Paint defects & its remedies. Check & Find out different paint defects (run down, sagging, pin hole, orange peel, oil & water spot, over/ dry spray, uncover, shade variation etc.) Mark the defected area, Decide Techniques & apply remedies properly. Make Finished surface.
22. Apply Finish special effects for Modern furniture. (NOS: PCS/N9416)	Application Process of Finish special effects on different furniture & different surface. (like as- colour gradations, multi tones applying, different textures, etc.)
23. Apply Operating system of Powder coating technique. (NOS: PCS/N9417)	Pretreatment & Clean the metallic article in chemical (degreasing, de-rusting, activation, phosphating, passivation & water rinsing as where required etc.) Procedure of powder coating on cleaned article & baking in oven. Apply appropriate temperature & timing.
24. Perform Quality Testing for various Paints & Painted films. (NOS: PCS/N9418)	Check and identify the Paint defects & its remedies. Testing the quality of paints & Painted surfaces by various testing method & instruments.
25. Read and apply engineering drawing for different application in the field of work. (NOS: PCS/N9419)	Read & interpret the information on drawings and apply in executing practical work. Read & analyze the specification to ascertain the material requirement, tools and assembly/maintenance parameters. Encounter drawings with missing/unspecified key information and make own calculations to fill in missing

	dimension/parameters to carry out the work.
<p>26. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study. (NOS: PCS/N9420)</p>	Solve different mathematical problems
	Explain concept of basic science related to the field of study

7. TRADE SYLLABUS

SYLLABUS FOR INDUSTRIAL PAINTER TRADE			
Duration – One Year			
Duration.	Reference Learning Outcome	Professional Skills (Trade Practical) With Indicative Hours	Professional Knowledge (Trade Theory)
Professional Skill 84 Hrs; Professional Knowledge 15 Hrs	Perform Marking, sawing, planning, Chiseling, Drilling following safety precautions. (Mapped NOS: PCS/N9401)	<ol style="list-style-type: none"> 1. Introduction of trade skills and work application. (02hrs) 2. Safety attitude development of the trainee by educating them to use personal protective equipment (PPE) and Material safety data sheet (MSDS). (04hrs) 3. First-aid method and basic training. (02hrs) 4. Safe disposal of waste materials like- cotton waste, waste paint and waste paint material etc.(02hrs) 5. Hazard and non hazard identification and avoidance. (02hrs) 6. Use of fire fighting equipment, like- extinguishers, sand bucket, water etc. (07 hrs) 7. Identification of safety signs, like- Danger, warning, caution and personnel safety (01 hr) 8. Importance of trade training (02hrs) 9. Understand precautions to be followed while working in the painting jobs. (02hrs) 10. Motivational talk by experts.(03 hrs) 11. 5S training. (02hrs) 12. Draw different sketches and 	Introduction of the Institution; rules and management (work) Process of an Institution. Knowledge about the facilities; leaves and rules and subjects and syllabus. Introduction of vocational trade, The importance of trade in the industrial Development of the nation Care in Vocational trade. (08 hrs)

		Colour Scheme practice. (10 hrs)	
		13. Introduction and identification of tools and equipment different for cleaning and painting. (12 hrs) 14. Identification and there assembly and function of trade machineries. (10 hrs)	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. (04 hrs)
		CARPENTER WORK: 15. Marking Practice on wood. (05 hrs.) 16. Holding & Sawing Practice different size of wood. (10 hrs.) 17. Plane on different wooden surfaces. (03 hrs.) 18. Drilling on wood with different drilling tools (Gimlet, Hand Drill, Portable elect. drilling machine. (05 hrs)	Carpenter - safety precaution description, Use hand tools, carpenter tools, types of wood their description & use common defects in timber & their effects. (03 hrs)
Professional Skill 21Hrs; Professional Knowledge 05Hrs	Make various types of joints for different frames (like- Screen frame, sign board, & hanging Paintings frames). (Mapped NOS: PCS/N9402)	19. Make a simple lap joint.(04 hrs.) 20. Make a simple mitred half lap joint.(04 hrs.) 21. Make a simple Dovetail joint. (03 hrs.) 22. Joint fitting with nails, screw, glue etc. (10 hrs)	Equipments for joint, Joints - Types and uses of different types of joints. (05 hrs)
Professional Skill 84Hrs; Professional Knowledge 15 Hrs	Manufacture simple sheet metal items as per drawing and join them. (Mapped NOS: PCS/N9403)	SHEET METAL WORK: 23. Marking of straight lines, circles, profiles and various geometrical shapes and cutting the sheets with snips. (10 hrs.) 24. Marking out of simple development. (5 hrs.) 25. Marking out for flaps for joints. (5 hrs.) 26. Make various joints: hemming, form locked, grooved and knocked up	Safety precautions to be observed in a sheet metal workshop, sheet and sizes, Shearing machine- description, parts and uses. (04 hrs) Marking and measuring tools, wing compass, Prick punch, square tools, snips, types and

		<p>single hem straight and curved edges form double hemming. (10 hrs.)</p> <p>27. Make cylindrical objects with joints. (10 hrs.)</p>	<p>uses. hammers and mallets type-sheet metal tools, Soldering iron, Trammel, Stakes (04 hrs)</p>
		<p>28. Bend sheet metal into various curvature form, wired edges- straight and curves. Fold sheet metal at angle using stakes. (8 hrs.)</p> <p>29. Make simple Square container with wired edge and fix handle. (15 hrs.)</p>	<p>Stakes-bench types, parts, their uses. Various types of metal joints, their selection and application, tolerance for various joints, their selection & application. Wired edges. (04 hrs)</p>
		<p>30. Make square tray with square soldered corner. (11 hrs.)</p> <p>31. Practice in soft soldering and silver soldering. (10 hrs.)</p>	<p>Solder and soldering: Introduction-types of solder and flux. Composition of various types of solders and their heating media of soldering iron. Method of soldering, selection and application-joints. Hard solder- Introduction, types and method of brazing. (03 hrs)</p>
<p>Professional Skill 21Hrs; Professional Knowledge 05 Hrs</p>	<p>Manufacture simple sheet metal items as per drawing and join them by soldering, brazing and riveting. (Mapped NOS: PCS/N9404)</p>	<p>32. Make simple Square table tray with folding edge and fix handle with riveting. (15 hrs.)</p> <p>33. Make simple triangular tray with folding edge and fix handle with riveting. (06 hrs.)</p>	<p>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 (05 hrs)</p>
<p>Professional Skill 42 Hrs; Professional Knowledge 08 Hrs</p>	<p>Explain and make various pipe fittings. (Mapped NOS: PCS/N9405)</p>	<p>34. Identify & check different types of pipe. (05 hrs)</p> <p>35. Do pipe cutting & threading. (08 hrs)</p> <p>36. Apply different types of pipe Joint / fitting of different materials & different diameter. (Use PVC pipe). (08 hrs)</p>	<p>Plumber: Instruction to the trade safety precautions and elementary first aid. Plumber hand tools description on rain water & pipe system including installation of water supply fitting. Description of different types of pipes & their use such as galvanized pipes, PVC pipes.</p>

			Pipe line leakage & Maintenance. (04 hrs)
		<p>37. Make joint/ fitting for rain water (Use PVC pipe). (08 hrs)</p> <p>38. Make joint/ fitting for water pipe line (Use GI pipe). (08 hrs)</p> <p>39. Make joint/ fitting for water Pipe line (Use PVC pipe). (05 hrs)</p>	Do (04 hrs)
Professional Skill 21Hrs; Professional Knowledge 05 Hrs	Join metal component by arc welding observing standard procedure. (Mapped NOS: PCS/N9406)	40. Welding - Striking and maintaining ARC, laying Straight-line bead. (21 hrs.)	Safety-importance of safety and general precautions observed in a welding shop. Precautions in electric and gas welding. (Before, during, after) Introduction to safety equipment and their uses. Machines and accessories, welding transformer, welding generators. (05 hrs)
Professional Skill 42 Hrs; Professional Knowledge 11 Hrs	<p>Cut and join metal component by gas (oxy-acetylene). (Mapped NOS: PCS/N9407)</p> <p>Join metal components by riveting observing standard procedure. (Mapped NOS: PCS/N9408)</p>	<p>41. Making square, butt joint and „T“ fillet joint-gas and ARC. (12 hrs.)</p> <p>42. Do setting up of flames, fusion runs with and without filler rod, and gas. (10 hrs.)</p> <p>43. Make butt weld and corner, fillet in ARC welding (20 hrs.)</p>	Welding hand tools: Hammers, welding description, types and uses, description, principle, method of operating, carbon dioxide welding. H.P. welding equipment: description, principle, method of operating L.P. welding equipment: description, principle, method of operating. Types of Joints- Butt and fillet as per BIS SP: 46-1988 specifications. Gases and gas cylinder description, kinds, main difference and uses. Setting up parameters for ARC welding machines- selection of Welding electrodes. Care to be taken in keeping electrode. (11 hrs)
Professional Skill 21Hrs; Professional	Prepare wooden surface using various techniques; decorate	44. Clean, sanding, knotting, stooping, staining preparation wooden surface	Polish paper-Types and uses. Putty - Definition, their material types and uses.

<p>Knowledge 05Hrs</p>	<p>& make a attractive wooden articles. (Mapped NOS: PCS/N5004)</p>	<p>properly for varnishing & polish. (02 hrs) 45. Make & apply putty for varnishing & polishing. (02 hrs) 46. Apply polish on prepared wooden surface with cotton rags. (02 hrs.) 47. Apply varnish on prepared wooden surface with brush. (03 hrs.) 48. Prepare wooden article & apply varnish with spray. (04 hrs.) 49. Prepare wooden article & apply melamine or PU wooden finish with spray. (04 hrs.) 50. Make a wooden top with thick layer of melamine polish. (04 hrs.)</p>	<p>Method of mixing & its different system of application. Varnish - Definition; types and characteristics of varnish. Process of making of varnish its importance and contains. Polish- Types and uses. Different application methods(05 hrs)</p>
<p>Professional Skill 21Hrs; Professional Knowledge 05 Hrs</p>	<p>Prepare different types of wooden surface (Like Plywood, MDF & low quality wood) & paint it. (Mapped NOS: PCS/N5110)</p>	<p>51. Prepare wooden surface properly for painting. (04 hrs) 52. wood primer by brush. (04 hrs) 53. Make a putty for wood finishing. (02 hrs.) 54. Apply putty & prepare wooden surface properly. (03 hrs.) 55. Do paint wooden surface properly with brush. (04 hrs) 56. Prepare & spray painting on different furniture taking all precautions. (04 hrs)</p>	<p>Paint- Definition; classification and use. Pigment, Binders, Solvent, oil, dryers; additives. Painting- Definition and importance of painting. Method of wooden surface painting. (05 hrs)</p>
<p>Professional Skill 21Hrs; Professional Knowledge 05 Hrs</p>	<p>Process on pipes & pipe line painting with colour code. (Mapped NOS: PCS/N5110, PCS/N5111)</p>	<p>57. Paint the GI pipe, take all precautions while painting. (04hrs.) 58. Paint the sanitary pipe, take all precautions while painting. (04hrs.) 59. Paint the MS square & round pipe, take all precautions while painting.</p>	<p>Intention and effects of pipe line painting, Colour Codes of pipe line painting. ISI colour code. (05 hrs)</p>

		(03 hrs.) 60. Paint deferent pipe line with colour code as per ISI. (10 hrs)	
Professional Skill 21Hrs; Professional Knowledge 05 Hrs	Demonstrate pipelines procedure & Safety aspect. (Mapped NOS: PCS/N9409)	61. Demonstrate knowledge of safety procedures in Industrial pipe line painting (Demo by video & charts). (12 hrs.) 62. Identify colour code wise– Pipe lines, different types of valves. (09 hrs.)	Safety for Industrial pipe line painting (05 hrs)
Professional Skill 21Hrs; Professional Knowledge 05 Hrs	Perform Graphics- Stickers pasting, fixing, locking on wooden or metal surface. (Mapped NOS: PCS/N9410)	63. Make simple graphics of radium's or vinyl & cut it. (06 hrs) 64. Select the Graphics and pest it on selected (wooden/Metallic) surface properly. (06 hrs) 65. Use lacquer or varnish spray and coat layer of lamination. (09 hrs)	Use of graphics for attractiveness & deferential look ness, Procedure of pasting. Their instruments Procedure of locking edges of graphic material. Surface coating and even ness (one layer coat) their material & spraying method. (05 hrs)
Professional Skill 63Hrs; Professional Knowledge 10 Hrs	Demonstrate process of cleaning on metal surface for preventive coat. (Mapped NOS: PCS/N5110)	66. Scrap the corrode metal surface. (06 hrs) 67. Clean the metal surface by w ire brush or orbital wire brush. (06 hrs) 68. Burn the old paint from metal surface by blow lamp or gas flame. (06 hrs) 69. Do dry sanding with help of emery paper/cloth (06 hrs) 70. Apply wet sanding on old painted object. (06 hrs) 71. Clean the metal surface by Sander machine. (05 hrs.) 72. Level different metal surface by portable hand grinder. (05 hrs.)	Corrosion- Definition and classification. Reasons for rusting and effect of climate. Different anti-rusting process. (07 hrs)
		73. Apply degreasing process on metal surface. (05 hrs) 74. Apply de-rusting or pickling process on corrode metal. (06 hrs.)	Metal surface - types and selection of sanding paper (polish paper). Metal surface cleaning- Mechanical and chemical cleaning.

		<p>75. Treated phosphating on metal surface with all pre-treatment process. (06 hrs)</p> <p>76. Demonstrate practical of Different types of , Industrial Pt system by video. (06 hrs)</p>	(Dry/ wet Sanding, scraping, wire brushing, orbital wire brushing, paint burning, sand and shot- blasting, pickling and phosphating). (03 hrs)
Professional Skill 42 Hrs; Professional Knowledge 08 Hrs	Demonstrate process of painting on metal surface for preventive coat. (Mapped NOS: PCS/N5111)	<p>77. Make a proper thin metal primer for brush application. (02 hrs.)</p> <p>78. Prepare metal surface & apply ready primer on metal surface by brush. (04 hrs)</p> <p>79. Apply enamel / polyester putty or filler on primed surface. (08 hrs)</p> <p>80. Apply enamel paint on primed metal surface. (08 hrs)</p>	Metal Primer - Types, Purpose, application and use. Types of surface. Types of solvent or reducers / thinner/ automotive paints (Enamel, NC, Stoving, PU, Epoxy, rubber base sound - deadner paint, metallic, pearl, water base automotive paint),lacquer. (04 hrs)
		<p>81. Prepare and paint metallic article by brush. (12 hrs.)</p> <p>82. Prepare & colour making for deep painting. (01 hr)</p> <p>83. Prepare article for deep painting. (03 hrs)</p> <p>84. Demonstrate practical of Electro coat Deepings process & conveyor system by video. (04 hrs)</p>	Types of painting process- Traditional and modern technology. Ex.- Brushing, Deeping, barreling, Airosole, roller coating, suction spray, vertical spray, pressure vessel, spray airless, electrostatic, powder coating etc. (04 hrs)
Professional Skill 21Hrs; Professional Knowledge 05 Hrs	Identify, replace and assemble different pneumatics and paint gun. [Different components – Compressor, Pressure Gauge, Filter Regulator. Valve for hose] (Mapped NOS: PCS/N9411)	<p>85. Identify pneumatic components – Compressor, pressure gauge, Filter-Regulator-Lubricator (FRL) unit, and Different types of valves and actuators. (04 hrs.)</p> <p>86. Demonstrate knowledge of safety procedures in spray systems and personal Protective Equipment (PPE) (orally & video). (04 hrs.)</p> <p>87. Maintenance, troubleshooting, and safety aspects of pneumatic and Painting instruments (The</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.(05 hrs)

		practical for this component may demonstrated by video). (13 hrs.)	
Professional Skill 21Hrs; Professional Knowledge 05 Hrs	Perform Spray Painting technique. (Spray Gun / hose handling, air & paint pressure controlling.) (Mapped NOS: PCS/N9412)	88. Knowledge & Inspect spray gun holding and stroke adjustment, Paint adjustment, air adjustment techniques. (12 hrs) 89. Spraying practice on the surface like as edges, corner, square, round & curved area. (09 hrs.)	Description of spray painting plant. Types of booth, description of booth, care and maintenance of spary booth.(05 hrs)
Professional Skill 21Hrs; Professional Knowledge 05 Hrs	Demonstrate operating system of spray booths, Oven, cleaning & their maintenance, application of sealant component on metallic joints. (Mapped NOS: PCS/N9413)	90. Operate, maintenance, troubleshooting, and safety aspects of paint spray booth. (06 hrs.) 91. Operate, and safety aspects of Oven Setting, temperature & timing. (06 hrs.) 92. 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). (05 hrs)
Professional Skill 42 Hrs; Professional Knowledge 08 Hrs	Perform aspect ratio mixing of paint, hardener& solvent. Measure Viscosity of paint. Operate the Spray painting system. (Mapped NOS: PCS/N5109)	93. Paint preparation & mixing for spray painting. (05 hrs) 94. Practice to Measure the viscosity of paint. (08 hrs) 95. Spray Painting practice on ornamental objects, with deferent types of paints. (08 hrs) 96. Spraying metallic primer on metal surface. (05 hrs) 97. Apply Car-patch, Putty, Filler on metallic surface & prepare it. (08 hrs.) 98. Spraying Surfacer on primed or putty finish surface. (04 hrs) 99. Spraying finish Top Coat on prepared job. (04 hrs) Using enamel/ N.C. paints / latest paints.	Paint viscosity - importance, method of the paint viscosity. Paint preparation & mixing for different application. (04 hrs)
Professional	Develop spray	100. Prepare the surface of home	-do-

Skill 84 Hrs; Professional Knowledge 15 Hrs	painting in Home appliances, Agricultural equipment's, Machines, Automotive Bodies etc. (Mapped NOS: PCS/N9414)	appliances (ex- fan, cooler, fridge, washing machine etc.). (05 hrs)	
		101. Priming & surfacing on home appliances. (08 hrs)	
		102. Apply finish undercoat & top coat on home appliances. (08 hrs)	
		103. Prepare the surface of machine (ex- lath, drilling, grinding, compressor, suing machine etc.). (05 hrs)	Process of article and machine painting (08 hrs)
		104. Priming & surfacing on machine. (07 hrs)	
		105. Apply finish undercoat & top coat on machine. (07 hrs)	
		106. Prepare the Tow wheeler body and spares surface. (05 hrs)	Car: Process of repainting. (Removal of dent, car patch, putty process, metal primer, surface, paint) Spray painting. Types of paint defects & its remedies. Importance of polishing, removal defects by polishing, (07 hrs)
		107. Priming & surfacing the Tow wheeler body and spares surface. (05 hrs)	
		108. Apply finish undercoat & top coat on Tow wheeler body and spares surface. (05 hrs)	
		109. Apply Graphic sticker on painted surface properly & apply lacquer coat evenly. (04 hrs)	
		110. Identify the parts of Electrostatic gun assembly & operate it carefully. (08 hrs.)	-do-
		111. Identify the parts of Airless gun assembly & operate it carefully. (08 hrs.)	
		112. Demonstrate practical of Different types of Spray painting , Industrial Painting system by video (09 hrs)	
Professional Skill 63 Hrs; Professional Knowledge 10 Hrs	Remove dents & recover the damaged accidental area. Repaint & recover damaged area. Remedies of paint	113. Disassemble essential damage parts, inspect & mark denting area. Choose & decide process tools for denting. (06 hrs)	Removal of defects by polishing. Removal dented area on the different surface, types of denting process. (07 hrs)
		114. Removed dent on marked	

	defects. (Mapped NOS: PCS/N9415)	<p>area, apply essential method. (08 hrs)</p> <p>115. Do sanding or burn on denting area & apply primer & surface. Apply putty layer on necessities area evenly. (08hrs)</p> <p>116. Use wet sanding, level denting surface area, apply thin coat of surfacer. (04hrs)</p> <p>117. Masking on unwanted area properly (04hrs)</p> <p>118. Match the shade Overlay proper equally on unmask area. (04 hrs)</p> <p>119. Unmasked the mask area carefully & checkout properly & touch-up it by necessary. process. (04 hrs)</p> <p>120. Apply final coat rub and wax properly & matched it. (04 hrs.)</p>	
		<p>121. Demonstrate knowledge of Paint defects & its remedies. (video) (04 hrs.)</p> <p>122. Check & Find out different paint defects (run down, sagging, pin hole, orange peel, oil & water spot, over/dry spray, uncover shade variation etc.) (05 hrs.)</p> <p>123. Mark the defected area, Decide Techniques & apply remedies properly. Make finished surface. (12 hrs)</p>	Types of paint defects & its remedies. Importance of polishing, removal defects by polishing, (03 hrs)
Professional Skill 21Hrs; Professional Knowledge 05Hrs	Apply Finish special effects for Modern furniture. (Mapped NOS: PCS/N9416)	124. Process Finish special effects on different furniture & different surface. (like as-colour gradations, malty tones applying, deferent textures, etc.) (21 hrs.)	Furniture making is a multiple skills, using different applications on one object like Painting, Polishing, Varnishing, Waxing, staining, PU coating textures creating etc.(05 hrs)
Professional Skill 21Hrs; Professional	Apply Operating system of Powder coating	125. Pre-treated & Clean the metallic article in chemical (degreasing, de-rusting,	Operating system of Powder coating technique. Chemical cleaning process,

Knowledge 05 Hrs	technique. (Mapped NOS: PCS/N9417)	activation, phosphating, passivation & water rinsing as where required etc.) (06 hrs.) 126. Proceed powder coating on cleaned article & bake it in oven in appropriate temperature & timing. (15 hrs.)	Types of coating powders, (05 hrs)
Professional Skill 21Hrs; Professional Knowledge 05 Hrs	Perform Quality Testing for various paints & Painted films. (Mapped NOS: PCS/N9418)	127. Demonstrate the Paint defects & its remedies. (video) (03 hrs.) 128. Test the quality of paints & Painted surfaces by various method & instruments. (18 hrs)	Different types of paints & painted surface testing equipments, Types of testing methods, Use & care.(05 hrs)
ENGINEERING DRAWING: (40 Hrs.)			
Professional Knowledge ED- 40 Hrs.	Read and apply engineering drawing for different application in the field of work. (Mapped NOS: PCS/N9419)	<p>Introduction to Engineering Drawing and Drawing Instruments –</p> <ul style="list-style-type: none"> • Conventions • Sizes and layout of drawing sheets • Title Block, its position and content • Drawing Instrument <p>Free hand drawing of –</p> <ul style="list-style-type: none"> • Geometrical figures and blocks with dimension • Transferring measurement from the given object to the free hand sketches. • Free hand drawing of hand tools and measuring tools. <p>Drawing of Geometrical figures:</p> <ul style="list-style-type: none"> • Angle, Triangle, Circle, Rectangle, Square, Parallelogram. • Lettering & Numbering – Single Stroke, double stroke, inclined <p>Dimensioning</p> <ul style="list-style-type: none"> • Types of arrowhead <p>Symbolic representation –</p> <ul style="list-style-type: none"> • Different symbols used in the related trade. 	
WORKSHOP CALCULATION & SCIENCE: (30 Hrs)			
Professional Knowledge WCS- 30 Hrs.	Demonstrate basic mathematical concept and principles to perform practical	<p>Unit, Fractions Classification of unit system Fundamental and Derived units F.P.S, C.G.S, M.K.S and SI units Measurement units and conversion</p>	

	<p>operations. Understand and explain basic science in the field of study. (Mapped NOS: PCS/N9420)</p>	<p>Factors, HCF, LCM and problems Fractions - Addition, subtraction, multiplication & division Decimal fractions - Addition, subtraction, multiplication & division Solving problems by using calculator Square root, Ratio and Proportions, Percentage Square and square root Simple problems using calculator Applications of Pythagoras theorem and related problems Ratio and proportion Ratio and proportion - Direct and indirect proportions Percentage Percentages - Changing percentage to decimal and fraction Material Science Types metals, types of ferrous and non-ferrous metals Physical and mechanical properties of metals Introduction of iron and cast iron Difference between iron & steel, alloy steel and carbon steel Properties and uses of rubber, timber and insulating materials Mass, Weight, Volume and Density Mass, volume, density, weight and specific gravity. Mensuration Area and perimeter of square, rectangle and parallelogram Area and perimeter of Triangles Levers and Simple machines Lever & Simple machines - Lever and its types Trigonometry Measurement of angles Trigonometrical ratios Trigonometrical tables</p>
<p>Project Work/ Broad areas:</p> <ol style="list-style-type: none"> Make a Sample of different painting types of defects on metal plates. Decorate small furniture or article. Paint & decorate kids Toys by spray. (ex-small cars, doll, etc.) Powder coating article like as gate lamp assembly, keychain, metallic toys. 		

SYLLABUS FOR CORE SKILLS

1. Employability Skills (Common for all CTS trades) (120 Hrs.)

Learning outcomes, assessment criteria, syllabus and Tool List of Core Skills subjects which is common for a group of trades, provided separately in www.bharatskills.gov.in / dgt.gov.in

LIST OF TOOLS & EQUIPMENT			
Industrial Painter Trade (For batch of 24 Candidates)			
S No.	Name of the Tools and Equipment	Specification	Quantity
A. TRAINEES TOOL KIT			
1.	Rule steel	24"	25 Nos.
2.	Drawing Board	Imperial size	25 Nos.
3.	Rule wooden (Consumable)	24"	25 Nos.
4.	Brush Round Short Hair- (Consumable)	0 to 12 No.	25 Nos.
5.	Brush Flat Short Hair - (Consumable)	0 to 12 No.	25 Nos.
6.	Varnish Brush soft hair- (Consumable)	25mm, 50mm, 75mm, 100mm	25 Nos.
7.	Stencil/ Paper Cutter (Consumable)	medium size	25 Nos.
B. SHOP TOOLS, INSTRUMENTS			
Lists of Tools and Equipments:			
8.	T' Square	Imperial size	2 Nos.
9.	Square Blade	150 mm	1 No.
10.	Safety google (white)		6 Nos.
11.	Scriber		5 Nos.
12.	Marking Gauge		1 No.
13.	Wing Compass	254 mm or 300 mm	5 Nos.
14.	Hand saw	450 mm	5 Nos.
15.	Hack Saw with Frame		5 Nos.
16.	Smoothing Plane		1 No.
17.	Mallet Round		5 Nos.
18.	Carpenter Hammer (Ball Pin)		2 Nos.
19.	Hammer (Crass Pin)		2 Nos.
20.	Portable Electric Hand Drill Machine		1 No.
21.	Drill Bits (Consumable)	3 mm, 5mm, 8mm, 10mm, 12mm	1each
22.	Chisel Knife-	5mm, 8mm, 10mm, 20mm, 30mm	1each
23.	Hacking Knife		1 No.
24.	Paint Tin Opener		2 Nos.
25.	Scraper Knife		5 Nos.

26.	Shave Huck Knife		1 No.
27.	Glider Knife		5 Nos.
28.	Pliers Insulated		1 No.
29.	Paint Burner (Acetylene Gas)		1Set
30.	Blow Lamp		2 Nos.
31.	Screw Driver	100mm / 200mm	2 each
32.	Step Ladder (Aluminum)	6 feet	2 Nos.
33.	working Bench	240 cm X 120 cm X 75 cm	1 No.
34.	Bench Vice	125mm	2 Nos.
35.	Weight Per Litter Cup	100 ml capacity	1 No.
36.	Ford Cop for Viscosity Measurement with stand	No.3 & No.4	2 each
37.	Mild Steel Panels	300 mm X 200 mm (18 X 22 SWG)	4Nos.
38.	Sink (Stainless steel)	H 250mm x W 450mm x L 600mm.	4 Nos.
39.	Fire Extinguisher	Arrange all proper NOCs and equipment from municipal / competent authorities.	
40.	Suction feed spray gun with accessories.	1 Ltr. Capacity of cup	2 Nos.
41.	Portable Electric Hand Grinder		1 No.
42.	Glosso Meter		1 No.
43.	Infra red lamp		2 Nos.
44.	Digital DFT meter		2 Nos.
45.	Orbital Sander Machine with dust collector		5 Nos.
46.	Aerograph (Air Brush/ Pen Gun)		1 No.
47.	Pneumatic Polishing Machine with Pads		5 Nos.
48.	Goggles (Consumable)		5 Nos.
49.	Face Mask & Respirator (Consumable)		5 Nos.
50.	Gloves (Rubber) (Consumable)		5 Nos.
51.	Pipe vice		2 Nos.
52.	Hacksaw		2 Nos.
53.	Pipe wrench	10" & 16"	2 Nos. each
54.	flat file- smooth finish	12"	2 Nos.
55.	circular cut file	12"	2 Nos.
56.	raft cut	12"	2 Nos.
57.	Gun Spray with Gravity Feed Cup with Complete accessories	with Complete accessories (Capacity- ¼ ltr. ,1/2 ltr. 1/3 ltr, 1 ltr.)	2 Nos. each
58.	Conventional Spray Gun For	with Complete accessories	2 Nos.

	Pressure Feed		
59.	Electric spray gun	with Complete accessories	1 Nos.
60.	Comb Gauge		2 Nos.
61.	Pencil Hardness Tester		2 Nos.
62.	Digital Weight Machine	Capacity 5 kg. weighing scale	1 No.
C. GENERAL INSTALLATION			
63.	Air Compressor	3 Phase, 2 HP	1 Nos.
64.	Air Compressor	single Phase, 1 HP	1 Nos.
65.	Pressure Feed Container with Conventional	20 ltr. Capacity with Complete accessories	1 set
66.	Electrostatic spray Gun unit	with complete accessories	1 set
67.	Airless Spray Gun unit	with complete accessories	1 set
68.	Sealer Drum Press Pump with Sealer Gun Assembly	with complete accessories	1 set
69.	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 No.
70.	Powder Coating set up with Gun booth & Oven		1 Unit
71.	Arc Welding Table -	Metal - 900 X 600 X 750 mm with Positioner	1
72.	Acetylene Cylinder		1 No.
73.	Oxygen Cylinders		1 No.
74.	Electric Spark Lighter		6 Nos.
75.	Oxygen Gas Pressure Regulator Double Stage		1 No.
76.	Acetylene Gas Pressure Regulator Double Stage		1 No.
77.	Rubber Hose	Acetylene, Diameter = 8 mm, Length = 10 meters	1 No.
78.	Rubber Hose -	Oxygen, Diameter = 8 mm, Length = 10 meters	1 No.
79.	Rubber Hose Clips	1/2 inch	6 Nos.
80.	Tong - Flat -	300 mm	4 Nos.
81.	cylinder Key		4 Nos.
82.	Gas welding torch with nozzle set	with Input voltage 415 (\pm 10%), Frequency – 50/60, Current range – 30/300, Efficiency - >85%	1 Nos.
D. Shop Floor Furniture and Materials			
84.	Stool		24 Nos.
85.	Desk with Locker		24 Nos.
86.	Metal Shelving Rack Open Type	1800 x 900 x 500 mm with 4	2 Nos.

		Adjustable Shelves	
87.	Steel Locker's with 8 Drawer's	One locker for each trainee	3 Nos.
88.	Green Glass Board	6'X4'	1 No.
89.	Cupboard		4 Nos.
90.	Instructor table		1No.
91.	Instructor chair		2 Nos.
E. Designing Lab			
92.	Computer's with Accessories (Table & Chair)	CPU: 32/64 Bit i3/i5/i7 or latest processor, Speed: 3 GHz or Higher. RAM: - 4 GB DDR-III or Higher, Wi-Fi Enabled. Network Card: Integrated Gigabit Ethernet, with USB Mouse, USB Keyboard and Monitor (Min. 17 Inch. Licensed Operating System and Antivirus compatible with trade related software.	3 set
93.	Anti Virus (Latest Version)		5 Nos.
94.	Software- Corel Draw /Acee - Dcee Viewer (Latest Version)		1 Each (Multi user)
95.	UPS		As required

ABBREVIATIONS

CTS	Craftsmen Training Scheme
ATS	Apprenticeship Training Scheme
CITS	Craft Instructor Training Scheme
DGT	Directorate General of Training
MSDE	Ministry of Skill Development and Entrepreneurship
NTC	National Trade Certificate
NAC	National Apprenticeship Certificate
NCIC	National Craft Instructor Certificate
LD	Locomotor Disability
CP	Cerebral Palsy
MD	Multiple Disabilities
LV	Low Vision
HH	Hard of Hearing
ID	Intellectual Disabilities
LC	Leprosy Cured
SLD	Specific Learning Disabilities
DW	Dwarfism
MI	Mental Illness
AA	Acid Attack
PwD	Person with disabilities

