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

**COMPETENCY BASED CURRICULUM**

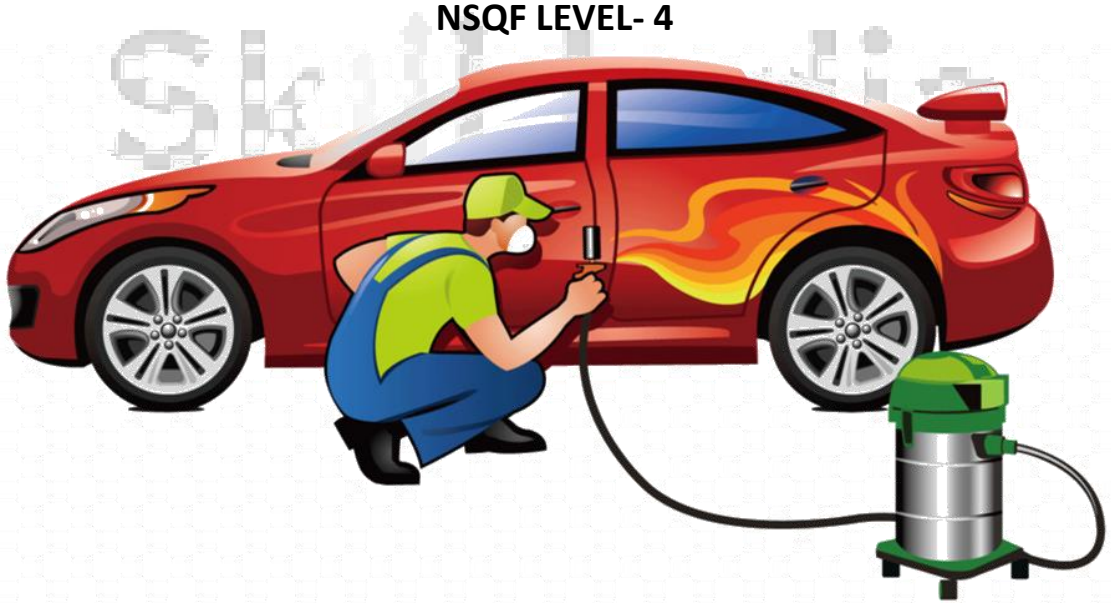
# AUTOMOTIVE PAINT TECHNICIAN

**(Duration: Two Years)**

## CRAFTSMEN TRAINING SCHEME (CTS)

**(Flexi MoU)**

**NSQF LEVEL- 4**



## SECTOR – AUTOMOTIVE

Directorate General of Training

Skill India
कौशल भारत-कुशल भारत

# AUTOMOTIVE PAINT TECHNICIAN

**(Engineering Trade)**

**(Designed in 2022)**

**Version: 1.0**

## CRAFTSMEN TRAINING SCHEME (CTS)

**(Flexi MoU)**

## NSQF LEVEL - 4



Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training
**CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE**
EN-81, Sector-V, Salt Lake City,
Kolkata – 700 091
www.cstaricalcutta.gov.in

## CONTENTS

# 1. COURSE INFORMATION

Flexi- MoU is one of the pioneer program under NCVT on the basis of the MoU in between DGET & Industry Training Partner (ITP) for propagating vocational training to allow industries to take advantage of various schemes for conducting training program in higher employment potential courses according to needs of industries. The concept of Flexi- MoU was introduced in June-July 2014. DGT and Industry Training Partner (ITP) shall decide to sign the memorandum of understanding to provide an opportunity to the youth to acquire skills related to Automobile and Manufacturing industry through specially designed "Learn and Earn" approach consisting a mix of theoretical and On-the-Job Training (OJT) components and hence improve their employability potential & to contribute in the overall growth of automobile and manufacturing industry by creating a pool of skilled resources.

During the two-year duration, a candidate is trained on subjects Professional Skill, Professional Knowledge, Engineering Drawing, Workshop Science & Calculation and Employability Skills. In addition to this, a candidate is entrusted to make/do project work and Extra-Curricular Activities to build up confidence. The practical skills are imparted in simple to complex manner & simultaneously theory subject is taught in the same fashion to apply cognitive knowledge while executing task.

The content broadly covers skills in manufacturing process of automobiles components and automobiles in today's automobile industry. The year wise course coverage is categorized as below:

**FIRST YEAR –** In first 12 months, the trainee will be able to Check & perform the basic of painting activities such as Surface sanding, painting, Inspection, Measuring & marking by using various Measuring & Marking tools. Plan & perform basic fastening & fitting operation by using correct hand tools, machine tools & equipment's, drilling, cutting, grinding equipment & operations and surface preparation & refinishing materials through using different kind of abrasives materials, filler materials, primers, intermediate coats & finish coat paints. The trainee will also be able to perform body fillers application using hand and power tools, about corrosion, causes & identification, methods of corrosion protection, basic surface preparation using hand & power tools, application & maintenance of refinishing equipment and service, repair and maintenance of Air compressor and compressed airlines.

**SECOND YEAR –** In next 12 months, the trainee will learn to perform painting techniques using different types of painting methods, application of surface preparation & masking, application of solvent base paints & Water base paint, plastic paints & polishing, color theory, color matching & tinting or color mixing and color evaluations. The trainee will also learn about paint defects, causes of defects, paint defect trouble shooting and final detailing of repairing of paints. Trace and test all electrical & electronic components & circuits and assemble circuit to ensure functionality of system (Paint both, Oven, Robot, Spray Gun, Electrostatic paint application equipment's, Paint and Sealer Pumps, Paint circulation system etc.

# 2. TRAINING SYSTEM

## 2.1 GENERAL

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

The best outcome from the ITP shall conduct courses pan-India locations leveraging the facilities and services available at ITIs, regional training centers, training centers of training partners, vendors and dealers associated with Industry Training Partner (ITP). They will ensure that not less than 50% of trainees are placed with Industry Training Partner (ITP) or its business partners for not less than Two years duration. It will also ensure the eligible trainees take up Apprenticeship / higher education in suitable streams and shall also guide the students to become Entrepreneurs. Industry Training Partner (ITP) will strictly follow the policy guidelines for Flexi - MoU as in place from time to time. No deviation for the same would be permitted. Every Alternate Month Admission and Exam for trades run under Flexi MoU at training locations of Industry Training Partner (ITP). Theory content to be 30% and practical content to be 70%.

**Broadly candidates need to demonstrate that they are able to:**

- Read & interpret technical parameters/documentation, plan work, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional knowledge, core skills & employability skills while performing the job.
- Check the survey drawing and data and rectify errors.
- Document the technical parameters related to the task undertaken. Process data recorded during field measurements and make relevant conclusions.

## 2.2 PROGRESSION PATHWAYS

- Can take admission in diploma course in notified branches of Engineering by lateral entry.
- Can join Apprenticeship programme in different types of industries leading to National Apprenticeship certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITIs.

## 2.3 COURSE STRUCTURE

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

| S No. | Course Element | Notional Training Hours | |
|---|---|---|---|
| | | 1st Year | 2nd Year |
| 1 | Professional Skill (Trade Practical) | 1680 | 1680 |
| 2 | Professional Knowledge (Trade Theory) | 180 | 180 |
| 3 | Workshop Calculation Science & Engineering Drawing | 150 | 150 |
| 5 | Employability Skills | 120 | 60 |
| | Total Hours | **4200** | |

## 2.4 ASSESSMENT & CERTIFICATION

I. Conducting training of selected candidates is the sole responsibility ofIndustrial Training Partner (ITP).

II. Assessment will be jointly done by ITP and DGT. Practical and formative assessment shall be conducted by ITP, and Computer Based theoretical exams shall be conducted by DGT.

III. ITP must refer to the latest examination reform guidelines issued by DGT dated 4thOctober 2018 any changes or revisions to the same shall be applicable to flexi-MoU scheme.

IV. Maximum attempts for clearing the exam and obtaining NTC shall be in line with CTS.

V. For practical examination and formative assessment, ITP has been given flexibility to design the questions, assess the candidates and upload their marks in the scheme portal.

VI. ITP shall develop a comprehensive Question Bank (in English and Hindi) of minimum 1000 questions, grouped by chapters and difficulty level. The same shall be vetted by NIMI experts and then be handed over to DGT for conducting theory exams. DGT may add some questions to the same before conducting actual exams.

VII. Theoretical exams shall be conducted by DGT in Computer Based Test format. Upon completion of course and payment of requisite examination fee by ITP, admit cards shall be generated by scheme portal.

VIII. DGT shall arrange for conduct of computer based theory exam at designated examination centres & certify the successful trainees with e-NTC under flexi-MoU scheme with mention of ITP name in the Certificate.

IX. Students, who have successfully appeared in the final exam after completion of course, are eligible to register as apprentices.

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 year itself.

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).

**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 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 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 and records of internal (Formative) assessments are to be preserved until forthcoming examination for audit and verification by examination body. The following marking pattern to be adopted while assessing:

| Performance Level | Evidence |
|---|---|
| (a) Weightage in the range of 60%-75% to be allotted during assessment | |
| For performance in this grade, the candidate should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices | • Demonstration of good skill in the use of hand tools, machine tools and workshop equipment.<br>• 60-70% accuracy achieved while undertaking different work with those demanded by the component/job.<br>• A fairly good level of neatness and consistency in the finish.<br>• Occasional support in completing the project/job. |
| (b) Weightage in the range of 75%-90% to be allotted during assessment | |
| For this grade, a candidate should produce work which demonstrates attainment of a reasonable standard of craftsmanship, with little guidance, and regard for safety procedures and practices | • Good skill levels in the use of hand tools, machine tools and workshop equipment.<br>• 70-80% accuracy achieved while undertaking different work with those demanded by the component/job.<br>• A good level of neatness and consistency in the finish.<br>• Little support in completing the project/job. |
| (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. | • High skill levels in the use of hand tools, machine tools and workshop equipment.<br>• Above 80% accuracy achieved while undertaking different work with those demanded by the component/job.<br>• A high level of neatness and consistency in the finish.<br>• Minimal or no support in completing the project. |

**AutomotiveSprayPainter/Painter/AutoBodyPaintingTechnician/Surface Treatment;**

As a Automotive spray painter, you will be responsible for filling, smoothing, and repairing each product's surface, mixing the coating liquids, and spraying each layer according to light and heavy vehicle spray painter (working with cars, vans and motorcycles).

- Examining and cleaning repaired bodywork and discussing what you need to do to finish it.
- Preparing the surface to be painted: cleaning it, buffing and polishing (by hand or using a machine), priming it and masking (covering) the parts not to be painted
- Mixing colors, usually using computerized paint mixing technology, to match the rest of the body colour.
- Auto Body Painting Technician paints, does the touch up and inspection of the body. A Painting Technician does the final painting, touch up and inspection of the body of the vehicle being painted.
- Applying the paint with a spray machine or hand held spray gun
- Buffing and polishing the surface between coats
- Working out estimates of costs
- Completing records of materials used.
- Keeping up to date with new products and working methods.

**Painter, Sign and Letter;** Painter, Signor Letter; Letter Writer; Sign Writer plans, lays out and paints in one or more languages letters, signs, figures and monograms on wooden boards, metal plates, walls etc. using pencil brushes and palette. Prepares layout for sign writing, coats back-ground with paint, using paint brushes and allows it to dry. Sketches outlines with free hand in chalk or pencil or gets them marked by dusting on stencils. Mixes paints and pigments to get desired color consistency and fill sin marked outlines of letters and designs with paint using pencil brushes of various sizes. May make signs by cutting out and sticking gold lead lettering to surfaces. May cut stencils and paint signs by brushing and spraying paint over them. May make signs of metal or wood. May transfer designs and monograms and to gliding, silvering, graining etc.

**Painter, Brush;** Painter, Brush applies decorative or protective materials such as paint, enamel, varnish, lacquer etc., on metal articles, wood, building boards and other materials using hand brush. Selects correct type of paint and brush, taking in to consideration suitability, durability, ease of application and cost or mixes pigments, oils and other ingredients to paint material, as required, to obtain desired color, shade and consistency. Cleans surfaces with brush, cloth or abrasive material. Removes dirt, grease or roughs pots and irregularities by scrapers, chemicals etc. and patches cracks and holes with putty or filler to provide smooth clean surface. Rubs or covers surfaces with appropriate prime coat to have suitable base or surface for painting. Brushes with hand one or more coats of paint material on it to required finish. Cleans brushes on completion of work and maintains them. May be designated according to object painted or material used.

**Reference NCO-2015:**

a) 7132.0202 - Auto Spray Painter/Painter
b) 7132.0203 - Auto Body Painting Technician –Surface Treatment
c) 7132.0204 - Automotive Body Painting Technician
d) 7132.0400 - Painter, Sign and Letter
e) 7132.0500 - Painter, Brush

## 4. GENERAL INFORMATION

| | |
|---|---|
| **Name of the Trade** | **Automotive Paint Technician** |
| **Course Code** | DGT/7.25 |
| **NCO – 2015** | 7132.0202, 7132.0203, 7132.0204, 7132.0400, 7132.0500 |
| **NSQF Level** | Level 4 |
| **Duration of Craftsmen Training** | Two year |
| **Entry Qualification** | Passed 10th Class examination or its equivalent |
| **Minimum Age** | 16 years as on first day of academic session. |
| **Unit Strength (No. Of Student)** | 20 |
| **Space Norms** | 64 Sq. m. |
| **Power Norms** | 3 KW |
| **Instructors Qualification for** | |
| **1. Automotive Painting Technician** | B.Voc/Degree in Automobile / Mechanical Engg. (with specialization in Automobile) from AICTE/UGC recognized Engineering College/university with one-year experience in the relevant field.<br>**OR**<br>3 years Diploma in Automobile/Mechanical (specialization in automobile) from AICTE recognized board of technical education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in the relevant field.<br>**OR**<br>NTC/NAC passed in the trade of "Mechanic Auto Body Painting" with three years' experience in the relevant field.<br><br>**Essential Qualification:**<br>Relevant National Craft Instructor Certificate (NCIC) in any of the variants under DGT.<br><br>***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.*** |
| **2. Workshop Calculation & Science** | Degree in Engineering with one-year experience.<br>OR<br>Diploma in Engineering with two years' experience.<br><br>**Essential Qualification:** |

| | |
|---|---|
| | Craft Instructor Certificate in RoD& A course under NCVT. |
| **3. Engineering Drawing** | Degree in Engineering with one year experience.<br>OR<br>Diploma in Engineering with two years' experience.<br>OR<br>NTC / NAC in the Draughtsman (Mechanical) with three years' experience.<br>**Essential Qualification:**<br>Craft Instructor Certificate in RoD& A course under NCVT. |
| **4. Employability Skill** | MBA or BBA with two years experience or Graduate in Sociology/ Social Welfare/ Economics with Two years experience or Graduate/ Diploma with Two years experience and trained in Employability Skills from DGT institutes.<br>**AND**<br>Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above.<br>OR<br>**Existing Social Studies Instructors duly trained in Employability Skills from DGT institutes.** |
| **List of Tools and Equipment** | As per Annexure – I |

# 5. NSQF LEVEL COMPLIANCE

NSQF level for **Automotive Paint Technician** trade CTS (Flexi MoU): **Level-4.**

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

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

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

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

The broad learning outcome of **Automotive Paint Technician** trade under CTS (Flexi MoU) mostly matches with the Level descriptor at Level- 4.

The NSQF Level-5 descriptor is given below:

| Level | Process Required | Professional Knowledge | Professional Skills | Core Skills | Responsibility |
|---|---|---|---|---|---|
| **Level 4** | Work in familiar, predictable, routine, situation of clear choice. | Factual knowledge of field of knowledge or study. | Recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts. | Language to communicate written or oral, with required clarity, skill to basic Arithmetic and algebraic principles, basic understanding of social political and natural environment. | Responsibility for own work and learning. |

# 6. LEARNING OUTCOME

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

## 6.1 GENERIC LEARNING OUTCOME

1. Identify & comply general safe working practices, environment regulation and housekeeping
2. Explain & perform different mathematical calculation & science in the field of study including basic electrical/ Mechanical. [Different mathematical calculation & science – Arthematics, graph, Statistics, Algebra, Geometry & Mensuration, Trigonometry, Work, Power & Energy, Heat & Temperature, Levers & Simple machine, Centre of gravity, Power transmission, Pressure]
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]
4. Select and find out measuring instrument and measure dimension of components and record data.
5. Explain entrepreneurship and manage/organize related task in day to day work for personal & societal growth.
6. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.
7. Explain occupational health, energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.
8. Explain & perform basic computer skills and TPS in day to day work to improve the productivity & quality
9. Plan and organize the work related to the occupation.



## 6.2 SPECIFIC LEARNING OUTCOME

**First Year:**

10. Familiarize with the institute/industry, course, type of work, rules & regulations and machinery used in trade & Industry Orientation
11. Recognize & comply with occupational health, safety & environmental practices to be followed in automobile paint shop/ body shop.
12. Demonstrate knowledge about Environment & ISO 14001
13. Measure & mark by using various measuring & marking tools and hand & power tools and equipment used in vehicle body paint shop.
14. Perform basic fastening & fitting operation by using correct hand tools, power tools & Equipment's.

15. Apply basic cutting, Drilling, Taps and grinding operations using correct hand & power tools.
16. Perform to trace and test all electrical & electronic components & circuits in a vehicle and assemble circuit to ensure functionality of system.
17. Perform basics of automobile industry & automobiles and identify & explain different types of vehicles, and service station equipment.
18. Identify & explain various equipment and parts, different types of tools used for paint application and service information & guideline to surface preparation.
19. Demonstrate function of air compressors, compressed airline, safety precautions using compressed air and perform simple service and maintenance of compressors, Water purification, recycle.
20. Identify & explain different types of OEM refinishing materials such as sealers & paints, abrasives, adhesives, epoxies and perform basic refinishing jobs.
21. Apply knowledge about the general painting application in arts and application of lettering & stencilling.
22. Apply knowledge about the general painting application in arts and application of drawing enlargement
23. Apply wall painting and explain purpose and their requirement
24. Identify & select body fillers & ingredients and perform surface preparation, body filler mixing, body filler application and finishing filled surface for primer after curing using appropriate hand & power tools.
25. Explain corrosion, causes & effects, anti-corrosion materials, identify area for corrosion Treatment and analyze & estimate paint repair direct & indirect cost estimate with Supervisor & estimating guide book.

**SECOND YEAR:**

26. Identify painting environment variables and perform to mix paints using viscosity cup, use different painting tools and equipment including disassemble, assemble, and clean paint guns.
27. Identify & select correct paint spray techniques, paint problems and apply troubleshooting skills.
28. Plan & organize to explain & perform surface preparation and masking jobs using hand & Power tools for carrying out automotive body paint works.
29. Identify functions of paint, OEM paint finishing &refinishing procedures, identify different types of paints and perform application of solvent based & plastic paints & polishing jobs.
30. Explain color theory & color evaluations in different lights, identify color adjustments, Perform color mixing (tinting) using computerized color matching systems, spraying Metallic colors and conduct color analyzing.
31. Wood surface painting and varnish painting.
32. Apply basic understanding in the quality and quality concepts. Identify the quality and testing of paints. Distractive and non-distractive quality test methods of paint surface.

## 7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

| GENERAL LEARNING OUTCOMES | |
|---|---|
| **LEARNING OUTCOMES** | **ASSESSMENT CRITERIA** |
| 1. Identify & comply general 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/conditions according to workplace policy. |
| | 1.3 Identify and take necessary precautions on fire and safety hazards and report according to workplace policy and procedures. |
| | 1.4 Identify different fire extinguisher and use the same as per requirement. |
| | 1.5 Identify& observe safety alarms accurately & Evacuation procedures according to workplace policy. |
| | 1.6 Identify and observe workplace policies and procedures in regard to illness or accident. |
| | 1.7 Report supervisor/competent authority in the event of accident or sickness of any staff and record accident details correctly according to workplace accident/injury procedures. |
| | 1.8 Identify basic first aid and use them under different circumstances. |
| | 1.9 Identify Personal Productive Equipment (PPE) and use the same as per related working environment. |
| | 1.10 Identify environmental pollution and contribute to avoidance of same. |
| | 1.11 Take opportunities to use energy and materials in an environmentally friendly manner. |
| | 1.12 Identify, handle and store/ dispose of dangerous/ unsalvageable goods and substances according to workplace policy and dispose waste as per procedures following safety regulations and requirements. |
| | 1.13 Recognizedifferentcomponentsof5Sandapplythe same in the working environment. |
| | |
| 2. Explain & perform different mathematical calculation & science in the field of study | 2.1 Solve the basic mathematical calculations related to statistics , Geometry & mensuration accurately. |
| | 2.2 Read & Interpret the given drawing and calculate the unknown terms. |

| | | |
|---|---|---|
| including basic electrical/ Mechanical. [Different mathematical calculation & science – Arthematics, graph, Statistics, Algebra, Geometry & Mensuration, Trigonometry, Work, Power & Energy, Heat & Temperature, Levers & Simple machine, Centre of gravity, Power transmission, Pressure]. | 2.3 | Measure dimensions as per drawing & use of appropriate tools. |
| | 2.4 | Ensure dimensional accuracy of parts/objects by using different instruments/gauges. |
| | 2.5 | Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat& temperature, force, motion, pressure, heat treatment, center of gravity, friction & solve the problems related to it. |
| | 2.6 | Explain basic Electricity, Insulation, earthing & electrical devices OR Explain the basic concepts of drilling, milling, grinding. |
| | | |
| 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] | 3.1 | Read & interpret the information on drawings and apply in executing practical work. |
| | 3.2 | Read & analyze the specification to ascertain the material requirement, tools, and machining/ assembly/ maintenance parameters & dimensions. |
| | 3.3 | Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/ parameters to carry out the work. |
| | 3.4 | Practice & use ISOCPEUR (Engineering script) in day to day writing activities. |
| | 3.5 | Analyze and draw the drawings from Isometric to orthographic projection & vice versa. |
| | 3.6 | Practice & draw the free hand sketches related to their trade tools. |
| | | |
| 4. Select and find out measuring instrument and measure dimension of components and record data. | 4.1 | Select appropriate measuring instruments such as micrometers, Vernier calipers 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 with the given drawing/measurement. |
| | | |
| 5. Explain entrepreneurship and manage/organize related task in day to day | 5.1 | Explain the need & scope of entrepreneurship. |
| | 5.2 | Explain role of various schemes and institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for |

| | | |
|---|---|---|
| work for personal & societal growth. | | financing/ non-financing support agencies to familiarize with the Policies/Programmes, procedure and the available scheme. |
| | 5.3 | Explain the concept of SWOT analysis & risk management. |
| | 5.4 | Explain and understand the qualities of entrepreneurship. |
| | | |
| 6. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality. | 6.1 | Explain the concept of productivity, quality tools & its necessity and apply during execution of job. |
| | 6.2 | Explain the concept how to enhance the productivity through working aids, automation etc at workplace. |
| | 6.3 | Explain the concept of comparative productivity in the development of countries. |
| | 6.4 | Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws. |
| | 6.5 | Knows benefits guaranteed under various acts. |
| | | |
| 7. Explain occupational health, energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources. | 7.1 | Explain the concept of occupational hygiene, first aid, accident preventions technique at workplace. |
| | 7.2 | Explain the concept of energy conservation, global warming, and pollution and utilize the available resources optimally & remain sensitive to avoid environment pollution. |
| | 7.3 | Dispose waste following standard procedure. |
| | | |
| 8. Explain & perform basic computer skills and TPS in day to day work to improve the productivity & quality. | 8.1 | Recognize the parts of computer & its functions and how to apply in day to day usage. |
| | 8.2 | Explain about the operating systems & management of files in windows [ new versions] – Excel , Word & Power point. |
| | 8.3 | Create & format the word documents as per the requirements. |
| | 8.4 | Create a worksheet, apply simple formulae & graphs. |
| | 8.5 | Explain the concept of computer network in daily life [LAN,WAN] |
| | 8.6 | Explain the concept of TPS and apply in executing practical work/ workplace. |
| | | |
| 9. Plan and organize the work related to the | 9.1 | Use documents, drawings and recognize hazards in the work site. |

| | | |
|---|---|---|
| occupation. | 9.2 | Plan workplace/assembly location with due consideration to operational stipulation. |
| | 9.3 | Communicate effectively with others and plan project tasks. |
| | 9.4 | Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same. |
| | | |

| SPECIFICLEARNINGOUTCOME | |
|---|---|
| **LEARNING OUTCOMES** | **ASSESSMENT CRITERIA** |
| 10. Familiarize with the institute/industry, course, type of work, rules & regulations and machinery used in trade & Industry Orientation. | 10.1 Understand course, general rules pertaining to Institute & Industry, available facilities and timetable. |
| | 10.2 Recognize & explain machinery used in trade. |
| | 10.3 Identify type of work to be done during the course. |
| | |
| 11. Recognize & comply with occupational health, safety & environmental practices to be followed in automobile paint shop/ body shop. | 11.1 Identify importance of Safety and general Precautions to be observed in the shop. Basic first aid, safety signs-for Danger, Warning, caution & personal safety message. |
| | 11.2 Recognize Safe handling of Fuel Spillage, Fire extinguishers used for Different types of fire. |
| | 11.3 Identify First-Aid, nature and causes of injury and utilization of first-aid. |
| | 11.4 Comply with Safety signs and norms. |
| | 11.5 Perform Safe disposal of toxic waste. |
| | 11.6 Comply with safe handling and Periodic testing of lifting equipment, Authorization of Moving &road testing vehicles. |
| | 11.7 Recognize Energy saving Tips/Audit of institute/body shop electricity Usage. |
| | 11.8 Perform Hazard identification, dust, thinner &paint (chemical) hazard etc and counter measure to eliminate them & usage of specified PPEs. |
| | |
| 12. Demonstrate knowledge about Environment & ISO 14001. | 12.1 Understand about Environment challenges |
| | 12.2 Understand the different types of pollution. |
| | 12.3 Measuring different types of pollution |
| | 12.4 Remedies to control the environment issues.. |
| | 12.5 Global standards and their use. |
| | |
| 13. Measure & mark by using various measuring & marking tools and hand & power tools and equipment used in vehicle body paint shop. | 13.1 Conduct marking using all marking aids, like steel rule with spring calipers, dividers, scriber, punches, Chisel etc. |
| | 13.2 Layout work piece-for line, circle, arcs and circles. |
| | 13.3 Measure wheel base of a vehicle with measuring tape. |
| | 13.4 Remove wheel lug nuts with use of an air impact wrench. |
| | 13.5 Operate all workshop hand tools & power tools. |
| | 13.6 Operate body shop powered equipment as per operating manual with safety. |
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| 14. Perform basic fastening & fitting operation by using correct hand tools, power tools & Equipment's. | 14.1 Perform general cleaning of vehicle. |
| | 14.2 Fit nut, bolts, & studs etc. and check torque value. |
| | 14.3 Remove stud/bolt from blind hole. |
| | 14.4 Remove & refit of lock nuts, circlips, and lock rings. |
| | 14.5 Perform riveting using drilling and riveting tools. |
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| 15. Apply basic cutting, Drilling, Taps and grinding operations using correct hand & power tools. | 15.1 Identify and use PPE for different cutting &grinding works. |
| | 15.2 Define safety precautions during cutting, Drilling, taps & grinding operations using hand & power tools. |
| | 15.3 Make jobs using cutting tools like Hacksaw, files, chisel & Sheet cutting scissors. |
| | 15.4 Perform OFF-hand grinding with sander. |
| | 15.5 Cut steel metal using hand held power saw. |
| | 15.6 Perform grinding work using pneumatic, electric and battery powered grinder. |
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| 16. Perform to trace and test all electrical & electronic components & circuits in a vehicle and assemble circuit to ensure functionality of system. | 16.1 Prepare wire connections by joining wires using soldering Iron. |
| | 16.2 Learn the key points by hand sanding. |
| | 16.3 Know more about different consumable materials |
| | 16.4 Learn different types of machine maintenance and service |
| | 16.5 Understand the process of correction method. |
| | 16.6 Trace the auto electrical components by using vehicle wiring circuits. |
| | 16.7 Check the condition of the solenoid switch in the starting system. |
| | 16.8 Verify ohm's law and measure resistance using rheostat. |
| | 16.9 Perform battery charging and check performance. |
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| 17. Perform basics of automobile industry & automobiles and identify & explain different types of vehicles, and service station equipment. | 17.1 Identify of different type of vehicles. |
| | 17.2 Identify the different vehicle specification data and vehicle information number (VIN). |
| | 17.3 Demonstrate the garage, service station different equipment. |
| | 17.4 Operate Vehicle hoists–Two post and four post hoist, Engine hoists, Jacks, Stands. |
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| 18. Identify & explain various equipment and parts, different types of tools used | 18.1 Perform maintenance the equipment. |
| | 18.2 Identify different equipment's |
| | 18.3 Identify the process of equipment maintenance. |

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| for paint application and service information & guideline to surface preparation. | 18.4 Basic painting, surface preparation process. |
| | 18.5 Surface preparation method with using various tools. |
| | 18.6 Identify different final coat colors from color matching guides. |
| | 18.7 Identify parts from different models of equipment's and hand tools. |
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| 19. Demonstrate function of air compressors, compressed airline, safety precautions using compressed air and perform simple service and maintenance of compressors, Water purification, recycle. | 19.1 Identify the parts of a piston type stationary compressor. |
| | 19.2 Overhaul Air compressor and Overhauling of service (FRL) unit. |
| | 19.3 Drain the air receiver and the moisture separator/regulator or air transformer. |
| | 19.4 Check the level of the oil in the crank case, clean air filter. |
| | 19.5 Clean or blow of finson cylinders, heads, intercoolers, after coolers. |
| | 19.6 Check the oil filter in the air line and change the filter element if necessary, Adjust the pressure switch cut-in and cut-out settings if needed. |
| | 19.7 Check the relief valve for exhausting of head pressure each time the motor stops. |
| | 19.8 Tighten belts to prevent slippage. |
| | 19.9 Check and align a loose motor pulley or compressor Flywheel. |
| | 19.10 Check for air leaks on the compressor outfit and air piping system. |
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| 20. Identify & explain different types of OEM refinishing materials such as sealers & paints, abrasives, adhesives, epoxies and perform basic refinishing jobs. | 20.1 Identify the different type of refinishing material-paint binders, paint solvents, Paint additives. |
| | 20.2 Select the right repair materials for a particular job. |
| | 20.3 Select the right type of primer and paint. |
| | 20.4 Identify various type of masking material available in body shop. |
| | 20.5 Identify different type of body filler. |
| | 20.6 Identify various type of abrasive materials i.e. grit rating available in the workshop. |
| | 20.7 Identify the open and closed coat grit. |
| | 20.8 Cleaning, Pre- Treatment, surface conditioning, ED Coating of any given panel. |
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| 21. Apply knowledge about the general painting application in arts and application of | 21.1 Understand the general painting application. |
| | 21.2 Understand and Perform the Arts. |
| | 21.3 Perform the Lettering and stenciling skill. |

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| lettering & stencilling. | 21.4 Know more types of letter for lettering. |
| | 21.5 Identify the different types of materials for stencilling. |
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| 22. Apply knowledge about the general painting application in arts and application of drawing enlargement. | 22.1 Understand the general concept of drawing enlargement. |
| | 22.2 Understand and perform the drawing enlargement. |
| | 22.3 Perform/ draw the different types of pencil lines. |
| | 22.4 Perform/ draw the different types of shades. |
| | 22.5 Identify the different types of materials for drawing enlargement. |
| | |
| 23. Apply wall painting and explain purpose and their requirement. | 23.1 Understand the general concept of the application of wall painting. |
| | 23.2 Understand and perform the wall painting. |
| | 23.3 Perform/ draw the different types of defects on wall painting. |
| | 23.4 Perform/ fill the different types fillers. |
| | 23.5 Identify the different types of materials for wall painting. |
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| 24. Identify & select body fillers & ingredients and perform surface preparation, body filler mixing, body filler application and finishing filled surface for primer after curing using appropriate hand & power tools. | 24.1 Identify the different type of body filler, hardeners, and putties, used in industry. |
| | 24.2 Mix body filler compounds on a mixing board for applying Body filler. |
| | 24.3 Prepare damaged surface area of sheet metal. |
| | 24.4 Apply the body filler on a damaged sheet metal area. |
| | 24.5 Use Hand-blocks and in to smoothening and leveling a repair area properly after body filler curing. |
| | 24.6 Repair paint surface imperfections. |
| | 24.7 Perform Repairing of paint scratches, repairing nicks, repairing dings, preparing surface rust free. |
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| 25. Explain corrosion, causes & effects, anti-corrosion materials, identify area for corrosion Treatment and analyze & estimate paint repair direct & indirect cost estimate with Supervisor & estimating guide book. | 25.1 Carry out corrosion treatment on interior and exterior surface. |
| | 25.2 Identify how an estimating guide gives part pricing and labor time information. |
| | 25.3 Prepare repair estimate information with supervisor by using an estimating guidebook. |
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| 26. Identify painting environment variables and | 26.1 Mix paint in different ways using viscosity cup, mixing Sticks or other ways. |

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| perform to mix paints using viscosity cup, use different painting tools and equipment including disassemble, assemble, and clean paint guns. | 26.2 Test Spray Pattern, Practice on Adjusting Knobs, Effect of Spray on Gun stroke, Gun Speed, Gun Triggering. Direction, Spray Overlap. |
| | 26.3 Identify gun Handling Problems-Heeling, Arcing. |
| | 26.4 Spray gun cleaning tank, manual spray gun cleaning and spray gun lubrication. |
| | 26.5 Maintain spray booth. |
| | 26.6 Use Air-supplied respirators. |
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| 27. Identify & select correct paint spray techniques, paint problems and apply troubleshooting skills. | 27.1 Ensure perfection on an Air Spray Gun to achieve Different spray patterns viz. top heavy or bottom heavy, heavy to right or to left, heavy at center. |
| | 27.2 Spray avoiding split, pin holes, blushing or a whitish coat, orange peel (surface looks like orange peel). |
| | 27.3 Troubleshoot Excessive spray fog or over spray, No-control oversize of pattern, Sags or runs. |
| | 27.4 Troubleshoot Streaks Guns putters constantly, uneven spray pattern, fluid leaks from spray gun. |
| | 27.5 Troubleshoot fluid leaks from packing nut, fluid leaks through fluid tip when trigger is released. |
| | 27.6 Troubleshoot excessive fluid, fluid not coming out from spray gun, fluid not coming out from fluid tank or canister. |
| | 27.7 Troubleshoot Sprayed coat short of Liquid material, spotty, uneven pattern, slow to build, unable to get round spray, dripping from fluid tip. |
| | 27.8 Troubleshoot Sprayed coat short of Liquid material, spotty, uneven pattern, slow to build, unable to get round spray, dripping from fluid tip. |
| | 27.9 Troubleshoot Excessive over spray, excessive fog, not spraying on pressure feed, not spraying on suction feed. |
| | 27.10 Troubleshoot Air leak at canister gas ket. |
| | 27.11 Troubleshoot Leak at setscrew in canister top, Leak between top of canister cover and gun body. |
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| 28. Plan & organize to explain & perform surface preparation and masking jobs using hand & Power tools for carrying out automotive body paint works. | 28.1 Check Paint Thickness (DFT) at different locations. |
| | 28.2 Paint removal using chemical stripping, and media blasting. |
| | 28.3 Prepare Bare Metal using metal conditioners. |
| | 28.4 Prepare hard chrome Surfaces. |
| | 28.5 Prepare metal for Replacement parts. |
| | 28.6 Apply spot putty, or glazing putty. |

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| | 28.7 Perform final sanding, using the right grit, power sanding, hand sanding, dry sanding, wet sanding |
| | 28.8 Carry out Surface Cleaning. |
| | 28.9 Mask the parts of a vehicle by using different masking techniques. |
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| 29. Identify functions of paint, OEM paint finishing &refinishing procedures, identify different types of paints and perform application of solvent based & plastic paints & polishing jobs. | 29.1 Identify different type of paint for top coatre finishing, paint used for refinishing. |
| | 29.2 Apply Prime coats. |
| | 29.3 Perform refinishing / painting/repairing of plastic part by applying Base coat/Clear coat. |
| | 29.4 Apply single stage paint. |
| | 29.5 Perform overall refinishing of the panel. |
| | 29.6 Removal of masking materials. |
| | 29.7 Polish the painted panels |
| | 29.8 Comply with safety rules when performing the above operations. |
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| 30. Explain color theory & color evaluations in different lights, identify color adjustments, Perform color mixing (tinting) using computerized color matching systems, spraying Metallic colors and conduct color analyzing. | 30.1 Evaluate painted panels under sunlight and colour Corrected light bulbs. |
| | 30.2 Match basic paint colour. |
| | 30.3 Spray metallic colour for finish. |
| | 30.4 Perform on let-down test panel for a three-stage finish |
| | 30.5 Perform a repair with a multistage mica or pearl finish. |
| | 30.6 Comply with safety rules when performing the above operations. |
| | 30.7 Evaluate paint finish under spectrophotometer or electronic colour analyzer. |
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| 31. Wood surface painting and varnish painting. | 31.1 Identify various type of masking wood application materials. |
| | 31.2 Property of Wood compared to metal and other. |
| | 31.3 Wood Surface Preparation before Polishing/ Vanishing procedure. |
| | 31.4 Step BY Step Putty application And keypoints to be followed |
| | 31.5 Difference between Painting and Varnishing. |
| | 31.6 Surface preparation for wood materials |
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| 32. Apply basic understanding in the quality and quality concepts. Identify the | 32.1 Understand the Remove of foreign matter from dry or wet method. |
| | 32.2 Understand the quality and quality concepts. |

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| quality and testing of paints. Distractive and non-distractive quality test methods of paint surface. | 32.3 Identify the quality and testing of paints |
| | 32.4 Understand the Distractive and non-distractive quality testing methods. |
| | 32.5 Perform/Execution the Distractive and non-distractive quality testing in various methods. |
| | 32.6 Understand the automotive industry quality parameters and requirements. |
| | 32.7 Automotive industry testing methods and standards. |
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## 8. SYLLABUS

| SYLLABUS – AUTOMOTIVE PAINT TECHNICIAN | | | |
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| **WEEK** | **Reference Learning Outcome** | **Professional Skills (Trade Practical)** | **Professional Knowledge (Trade Theory)** |
| **First Year** | | | |
| 1 | Familiarize with the institute/ industry, course, type of work, rules & regulations and machinery used in trade & Industry Orientation. | **Admission &induction to the trade (30 hrs)**<br>1. Understand course, general rules pertaining to Institute &Industry, available facilities and timetable<br>2. Recognize & explain about trade.<br>3. Type of work to be done during the course. | **Admission & introduction to the trade (5 hrs)**<br>• Familiarization with institute.<br>• Job opportunities in the automobile sector.<br>• Introduction to the Course, duration, course content, study of the syllabus.<br>• General rule pertaining to the Institute, facilities available-Hostel, Recreation, Medical and Library working hours and time table. |
| 2-3 | Recognize & comply with occupational health, safety & environmental practices to be followed in automobile paint shop/ body shop. | **Practical related to Safety and Health (68 hrs)**<br>4. Importance of Safety and general Precautions to be observed in the shop. Basic first aid, safety signs-for Danger, Warning, caution & personal safety message.<br>5. Safe handling of Fuel Spillage, Fire extinguishers used for Different types of fire<br>6. First-Aid, nature and causes of injury and utilization of first-aid<br>7. Safety signs and norms.<br>8. Safe disposal of toxic waste.<br>9. Safe handling and Periodic testing of lifting equipment, Authorization of Moving & road testing vehicles thinner & paint (chemical) hazard etc and countermeasure to eliminate them & usage of specified PPEs. | **Occupational Safety & Health (8 hrs)**<br>• Importance of Safety and general Precautions to be observed in the shop.<br>• Basic first aid.<br>• Safety signs-for Danger, Warning, caution & personal safety message.<br>• Safe handling of Fuel Spillage, Fire extinguishers used for Different types of fire.<br>• Safe disposal of toxic dust, safe handling and Periodic testing of lifting equipment, Authorization of Moving & road testing vehicles.<br>• Energy conservation-Definition, Energy Conservation Opportunities (ECOs)-Minor ECOs and |

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| | | 10. Energy saving Tips/Audit of institute /body shop electricity Usage.<br>11. Hazard identification& Dust. | Medium ECOs, Major ECOs), Safety disposal of Used engine oil, Electrical safety tips.<br>• Hazard identification, spatter hazard etc and counter measure to eliminate them & importance of usage of PPEs |
| 4-5 | Demonstrate knowledge about Environment & ISO 14001. | **Practical related to environment & ISO standard (68 hrs)**<br>12. Environment awareness & training.<br>13. Comply with legal & other requirement.<br>14. Green belt development.<br>15. Establish O & T with continual improvement.<br>16. Company ISO Organization – Company EMT (Environment Management Representative).<br>17. Do's & Don'ts of ISO.<br>18. Energy saving Tips/Audit of institute /body shop electricity Usage.<br>19. Safety signs and norms.<br>20. Safe disposal of toxic waste.<br>21. Safe handling and Periodic testing of lifting equipment, Authorization of Moving & road testing vehicles.<br>22. Hazard identification, dust, thinner & paint (chemical) hazard etc. | **Enhancing environment policy & ISO 14001 standard (8 hrs)**<br>• Environment awareness & training<br>• Comply with legal & other requirement.<br>• Green belt development.<br>• Establish O & T with continual improvement.<br>• Company ISO Organization – Company EMT (Environment Management Representative)<br>• Do's & Don'ts of ISO<br>• Safe disposal of toxic dust, safe handling and Periodic testing of lifting equipment, Authorization of Moving &road testing vehicles.<br>• Energy Conservation-Definition, Energy Conservation Opportunities (ECOs)-Minor ECOs and Medium ECOs, Major ECOs), Safety disposal of Used engine oil, Electrical safety tips.<br>• Hazard identification, spatter hazard etc and counter measure to eliminate them & importance of usage of PPEs. |
| 6 | Measure & mark by using various measuring & marking tools and | **Hand Tools (34 hrs)**<br>23. Conduct marking using all marking aids, like steel rule with spring callipers, dividers, | **Hand Tools (4 hrs)**<br>• Marking scheme, Marking material- chalk, Prussian blue. |

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| | hand & power tools and equipment used in vehicle body paint shop. | scriber, punches, Chisel etc.<br>24. Layout a work piece- for line, circle, arcs and circles.<br>25. Measure wheel base of a vehicle with measuring tape.<br>26. Remove wheel lug nuts with use of an air impact wrench.<br>27. Operate all workshop hand tools & power tools<br>28. Operate body shop powered equipment as per operating manual with safety. | • Cleaning tools- Scrapper, wire brush, Emery paper.<br>• Description, care and use of Surface plates, steel rule, measuring tape, try square.<br>• Calipers-inside and outside.<br>• Dividers, surface gauges, scriber.<br>• Punches- prick punch, center punch, pin punch, hollow punch, number and letter punch.<br>• Chisel-flat, crosscut.<br>• Hammer- ball peen, lump, mallet, different type of body hammers, pick hammers, bumping hammers, finishing hammers, dolly block, and body spoon, body picks, body pullers and pull rods, suction cup.<br>• Screw drivers-blade screwdriver, Phillips screw driver, Ratchet screw driver. Allen key.<br>• Bench vice & C-clamps, Spanners & Sockets- ring spanner, open end spanner &the combination spanner, universal adjustable open end spanner, Sockets & accessories.<br>• Pliers - Combination pliers, multi grip, long nose, flat-nose, Nippers or pincer pliers.<br>• Metal cutting shears- Tin snips, sheet metal cutting pliers,(Aviation snips), panel cutters.<br>• Trim and upholstery tools, Door handle tool (clip pullers),<br>• Metal files reveal file, surform |

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| | | | file, sanding board, sanding block, Spreaders & Squeegees. |
| 7 | Perform basic fastening & fitting operation by using correct hand tools, power tools & Equipment's. | **Fasteners (34 hrs)**<br>29. Perform general cleaning of vehicle.<br>30. Fitting of nut, bolts, & studs etc. and checking torque value.<br>31. Removal of stud/bolt from blind hole.<br>32. Remove & refit of locknuts, circlips, and lock rings.<br>33. Riveting using drilling and Riveting tools. | **Fasteners (4 hrs)**<br>• Study of different types of screws, nuts, studs & bolts, rivets, and locking devices such as lock nuts, cotter, split pins, keys, circlips, lock rings, lock washers and locating where they are used. Washers & chemical compound scan be used to help secure the fasteners.<br>• Selection of materials for gaskets and packing<br>• Description of Riveting tools |
| 8-9 | Apply basic cutting, Drilling, Taps and grinding operations using correct hand & power tools. | **Cutting tools &Limit, Fit & Tolerances (68 hrs)**<br>34. Identify and use PPE for different cutting & grinding works.<br>35. Define safety precautions during cutting & grinding operations using hand & power tools.<br>36. Make jobs using cutting tools like Hacksaw, files, chisel & sheet cutting scissors.<br>37. OFF-hand grinding with sander.<br>38. Cutting steel metal using hand held power saw.<br>39. Safety precautions to be observed while using a drilling machine<br>40. Marking and Drilling clear and Blind Holes<br>41. Sharpening of Twist Drills.<br>42. Selection of tape drill Size, use of Lubrication and tapping a Clear and Blind Hole.<br>43. Use of tap extractor for to | **Cutting tools & Limit, Fit & Tolerances (8 hrs)**<br>• Study of different type of cutting tools like Hacksaw, File-Definition, parts of a file, specification, Grade, shape, different type of cut and uses, chisel.<br>• OFF-hand grinding with sander, bench and pedestal grinders, safety precautions while grinding.<br>• **Limits, Fits &Tolerances**:- Definition of limits, fits & tolerances with examples used in auto components.<br>• **Drilling machine**-Description and study of Bench type Drilling machine, Portable electrical Drilling machine, drill holding devices, Drill bits.<br>• **Taps and Dies:** Hand Taps and wrenches, Calculation of Tap drill sizes for metric and inch taps. Different type of Die and Diestock. Screw extractors. |

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| | | remove a broken tap.<br>44. Cutting Threads on a Bolt/ Stud.<br>45. Adjustment of two piece Die and cutting thread on a pipe piece.<br>46. Reaming a hole/ Bush to suit the given pin/shaft, scraping a given machined surface and prepare seat of a drilled hole using hand reamer. | • **Hand Reamers**-Different Type of hand reamers, Lapping, Lapping abrasives, type of Laps. Function of Gaskets, Selection of materials for gaskets and packing, oil seals. |
| 10-11 | Perform to trace and test all electrical & electronic components & circuits in a vehicle and assemble circuit to ensure functionality of system. | **Basic electricity (68 hrs)**<br>47. Prepare wire connections by joining wires using soldering Iron.<br>48. Construction of simple electrical circuits and measuring of current voltage and resistance.<br>49. Verify DC series & parallel circuits and its characteristics.<br>50. Check out the open and Short circuits in the lighting circuits.<br>51. Using digital multimeter, practice continuity test for fuses, jumper wires, fusible links, circuit breakers.<br>52. Check the voltage drop in the auto electrical system by using multimeter.<br>53. Trace the auto electrical components by using vehicle wiring circuits.<br>54. Check the condition of the solenoids wit chin the starting system.<br>55. Verify ohm's law and measure Resistance using rheostat.<br>56. Perform battery charging and check performance. | **Basic electricity (8 hrs)**<br>• **Basic electricity,** Electricity principles, Ground connections, Ohm's law, Voltage, Current, Resistance, Power, Energy.<br>• Voltmeter, ammeter, Ohmmeter Mulitmeter, Conductors & insulators, Wires, Shielding, Length vs. resistance, Resistor ratings. |
| 12 | Perform basics of automobile industry & automobiles and identify & explain | **Automobile Industry & Authorities (34 hrs)**<br>57. Identification of different type of Vehicles.<br>58. Identify the different vehicle | **Automobile Industry & Authorities (4 hrs)**<br>• Auto Industry -History, leading manufacturers, development in automobile industry, trends, |

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| | different types of vehicles, and service station equipment. | specification data and vehicle information number (VIN)<br>59. Demonstration of Garage, Service station equipment's.<br>60. Operate Vehicle hoists – Two post and four post hoist, Engine hoists, Jacks, Stands. | new product.<br>• Brief about Ministry of Road transport & Highways, The Automotive Research Association of India (ARAI), National Automotive Testing and R&D Infrastructure Project (NATRIP), &Automobile Association.<br>• Definition: - Classification of vehicles on the basis of load as per central motor vehicle rule, wheels, final drive, and fuel used, axles, position of engine and steering transmission, body and load.<br>• Brief description and uses of Vehicle hoists–Two post and four post hoist, Engine hoists, Jacks, Stands. |
| 13-15 | Identify & explain various equipment and parts, different types of tools used for paint application and service information & guideline to surface preparation. | **Basic paint shop painting, surface preparation and surface defect correction tools and equipment's - Practical (103 hrs)**<br>61. Safety in paint shop operations.<br>62. Solvents and paint handling safety.<br>63. Surface sanding and primer application.<br>64. Paint Quality Inspection.<br>65. Air conditioning System and water purification equipment's and steps of operation.<br>66. AMU maintenance (Pocket filter, Sealing filter and Exhaust).<br>67. Spray guns' maintenance. | **Basic paint shop painting surface preparation and surface defect correction tools and equipment's - Theory (12 hrs)**<br>• Safety in paint shop operations,<br>• Solvents and paint handling safety.<br>• Surface sanding and primer application,<br>• Paint Quality Inspection,<br>• Air conditioning System and water purification equipment's and steps of operation,<br>• AMU working knowledge (Pocket filter, Sealing filter and Exhaust)<br>• Spray guns' maintenance |
| 16-18 | Demonstrate function of air compressors, compressed airline, safety precautions | **Compressor & Air system (103 Hrs)**<br>68. Identify the parts of a piston type stationary compressor.<br>69. Overhauling of Air compressor, Overhauling of | **Compressor & Air system (12 hrs)**<br>• Basic requirement for compressed air systems.<br>• Type of Compressor- |

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| | using compressed air and perform simple service and maintenance of compressors, Water purification, recycle. | service (FRL) unit.<br>70. Drain the air receiver and the moisture separator/ regulator or air transformer.<br>71. Check the level of the oil in the crankcase, clean air filters.<br>72. Clean or blow off fins on cylinders, heads, inter coolers, after coolers.<br>73. Check the oil filter in the air line and change the filter element if necessary, Adjust the pressure switch cut-in and cut-out settings if needed.<br>74. Check the relief valve for exhausting of head pressure each time the motor stops.<br>75. Tighten belts to prevent slippage.<br>76. Check and align a loose motor pulley or compressor Fly wheel.<br>77. Check for air leaks on the compressor outfit and air piping system. | Description and construction of Diaphragm compressor, piton type compressor-single stage and two stage, rotary screw air compressor.<br>• Performance of air compressor- Description of Horsepower, delivery volume, displacement, Free air delivery, compressor volumetric efficiency, tank size.<br>• Air and Fluid Control Equipment–In take air filter, Distribution system, regulator, lubricator, different type air purification method.<br>• Compressor Accessories-Hose type, hose size, maintenance of hose, connectors, adapters and couplings.<br>• Air System Maintenance-Study the typical piping arrangement found in a body/paint shop, color coding of airline, waterline and fuel line. |
| 19-25 | Identify & explain different types of OEM refinishing materials such as sealers & paints, abrasives, adhesives, epoxies and perform basic refinishing jobs. | **Refinishing Materials (238 hrs)**<br>78. Identify the different type of refinishing material- paint binders, paint solvents, Paint additives.<br>79. Select the right repair materials for a particular job.<br>80. Select the right type of primer and paint.<br>81. Identify various type of masking material available in body shop.<br>82. Identify different type of body filler.<br>83. Identify various type of abrasive materials i.e. grit rating available in the workshop.<br>84. Identify the open and closed | **Refinishing Materials (28 hrs)**<br>• Primer-sealer, topcoats.<br>• Paint material types-Lacquer, enamel, water base, Content of paint-pain pigments, paint binders, paint solvents, Paint additives,<br>• Definition of Drying, curing, flash, retarder, accelerator, catalyst, adhesion promoter, blending solvent, Toners.<br>• Primers & sealers-self-etching primer, UV primer Primer-surfacer, Epoxy primers, sealers,<br>• Other paint materials- prep solvent, flattener, fish-eye |

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| | | coat grit.<br>85. Cleaning, Pre- Treatment, surface conditioning, ED coating of any given panel. | eliminator, flex agent, Anti chip coating (Vinyl coating), Metal conditioner, Paint stripper, tack cloth.<br>• Different type of Body filler body filler(plastic filler), light body filler, fiber glass reinforced body filler, cream hardeners, Fiberglas resin, Glazing putty,<br>• Masking materials-Masking paper, Primer masking paper, paint masking paper, masking plastic, masking tape, Fine line masks, Wheel masks.<br>• Abrasives- abrasive material, grit, grit Ratings, open and closed coat grit, Grinding discs, sand paper- dry and wet type, scuff pads, Compounds-Rubbing compound, polishing compound, Adhesives<br>• Epoxies- Composition of Paints, Paint Types.<br>• Impact of paint & paint component on plastic and rubber |
| 26-28 | Apply knowledge about the general painting application in arts and application of lettering & stencilling. | **Practical on the application of lettering & stenciling (102 hrs)**<br>86. Standard form of letter writing,<br>87. Dimensions and proportion of letter writing (drawing /numbers /names) Uses of Stencil ,<br>88. Application of Stencil , creation of Stencil , Types of Stencils ,<br>89. Steps to be followed during creation of Stencils ,<br>90. Preservation and Pre-treatment of Stencil ,<br>91. Materials can be used to make stencil. | **Theory on the application of lettering & stenciling (12 hrs)**<br>• Use of lettering &stencilling<br>• Application areas in society.<br>• Way of application of lettering &stencilling<br>• Know Standard form of letter writing,<br>• How to draw with dimensions and proportion of letter writing(drawing /numbers /names) Uses of Stencil ,<br>• Application of Stencil, creation of Stencil, Types of Stencils,<br>• Steps to be followed during creation of Stencils, |

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| | | | • Preservation and Pre-treatment of Stencil,<br>• Materials can be used to make stencil. |
| 29-30 | Apply knowledge about the general painting application in arts and application of drawing enlargement. | **Practice drawing enlargement (70 hrs)**<br>92. Steps involved in Drawing.<br>93. Basics of Drawing Enlargement.<br>94. Scaling - reduction and enlargement method.<br>95. Types of drawing enlargement (Grid methodology, free-hand methodology or reference methodology, tracing methodology) involving. | **Theory on drawings and drawing enlargement (8 hrs)**<br>• Concepts in design and drawing<br>• Understand the requirement skill and knowledge.<br>• Know code and ethics of design<br>• Steps involved in Drawing , Basics of Drawing Enlargement,<br>• Scaling - reduction and enlargement method ,<br>• Types of Drawing enlargement (Grid methodology, free-hand methodology or reference methodology, tracing methodology) involving. |
| 31-34 | Apply wall painting and explain purpose and their requirement. | **Practice on wall painting (136 hrs)**<br>96. Identify the different type of Knives and its types (Putty knives or Stopping Knives, Scrapping Knives, Chisel Knives, Moulding Knives or Contour Knives, Pallet Knives, Stencil Knives.<br>97. Brushes and its parts, Types of Brushes reference to Shape, Types of Brushes reference to Purpose/ application.<br>98. Blow Lamp, Stippler, Pallet Board, Plumb Ball, Straight Edge / Ruler, Emery Sheets, Masking Tape, Shade Card, Ladder - types, purpose and usage, Wet-Flatting Machine, Mixer. | **Theory on wall painting (16 hrs)**<br>• Description of Wall Painting.<br>• Tools used and Purpose of Tools usage<br>• Identify the different type of Knives and its types<br>• Preparation surface for filler, Ingredient, characteristics and application of body filler &putties<br>• Brushes and its parts , Types of Brushes reference to Shape , Types of Brushes reference to Purpose/application ,<br>**Estimating Repair Costs**<br>• Description of estimate, Direct repair programs, Estimate time factor, work orders, Using Estimate Guides, Part prices, Labour costs, Job overlap, and included operation. |

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| 35-44 | Identify & select body fillers & ingredients and perform surface preparation, body filler mixing, body filler application and finishing filled surface for primer after curing using appropriate hand & power tools. | **Correcting/correction the defects through using Body Fillers (320 hrs)**<br>99. Identify the different type of body filler, hardeners, and putties, used in industry.<br>100. Mixing of body filler compounds on a mixing board for applying Body filler.<br>101. Preparation of damaged surface area of sheet metal.<br>102. Applying the body filler on a damaged sheet metal area.<br>103. Using Hand-block sanding to smooth and level a repair area properly after body filler curing.<br>104. Repairing of paint surface imperfections.<br>105. Perform Repairing of paint scratches, repairing nicks, repairing dings, preparing surface rust free. | **Correcting/correction the defects through using Body Fillers (30 hrs)**<br>• Description of Body Fillers (Plastic filler), Body filler ingredients, Body filler hardeners, Putties, light weight fillers, premium fillers, spot putties, polyester glazing putty, applying body filler.<br>• Preparation surface for filler, Ingredient, characteristics and application of body filler & putties, Mixing filler, kneading the hardener, mixing filler and hardener<br>• Spreading body filler,<br>• Grating and Sanding Body Filler- grating the filler, coarse, sandy filler, blow off sanding dust,<br>• Checking filler repair, applying second filler coat, feathered giving body filler, applying filler to body lines, applying filler to panel joint, applying filler to body lines, applying lead filler, priming filler area, applying glazing putty, using a guide coat.<br>• Rust repair procedures. |
| 45 - 50 | Explain corrosion, causes & effects, anti-corrosion materials, identify area for corrosion Treatment and analyze & estimate paint repair direct & indirect cost estimate with Supervisor & estimating guide | **Corrosion Protection & Repair Estimates (204 hrs)**<br>106. Carryout corrosion treatment on interior and exterior surface<br>107. Identify how an estimating guide gives part pricing and labour time information.<br>108. Preparation of repair estimate information with supervisor by using an estimating guidebook. | **Corrosion Protection& Repair Estimates (13 hrs)**<br>• What Is Corrosion, Causes for Loss of Factory protection, Anticorrosion Materials, Basic Surface Preparation, Corrosion Treatment Areas, Corrosion-Protection Primers, Exposed Joints, Exposed Interior Surfaces, Exposed Exterior Surfaces, Exterior Accessories,<br>**Estimating Repair Costs** |

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| | book. | | • Description of estimate, Direct repair programs, Estimate time factor, work orders, Using Estimate Guides, Part prices, Labour costs, Job overlap, and Included operation. |
| 51-52 | **Revision & Project work – 25 Hrs**<br>**Test / Examination – 40 Hrs** | | |
| **SECOND YEAR** | | | |
| 53-58 | Identify painting environment variables and perform to mix paints using viscosity cup, use different painting tools and equipment including disassemble, assemble, and clean paint guns. | **Solvent & Water bone paint Refinishing equipment Technology (200 hrs)**<br>109. Mixing paint in different ways using viscosity cup, mixing sticks or other ways.<br>110. Testing Spray Pattern, Practice on Adjusting Knobs, Effect of Spray on Gun stroke, Gun Speed, Gun Triggering, Gun Direction, Spray Overlap.<br>111. Gun Handling Problem Heeling, Arcing.<br>112. Spray gun cleaning tank, manual spray gun cleaning, and spray gun lubrication.<br>113. Maintaining spray booth.<br>114. Using Air-supplied respirators. | **Solvent & Water bone paint Refinishing equipment Technology (20 hrs)**<br>• Painting environment variable, Steps to keep dirt from finish during body repairs.<br>• Description of spray gun and its parts, basic stages of Atomization, High-<br>• Volume, Low-Pressure (HVLP) Spray Gun.<br>• Type of air spray gun-Gravity feed, Suction (siphon) feed, Pressure feed, Pressure-assist feed (gravity or suction cup spray guns) and their paint feed method, advantage and disadvantages.<br>• Spray gun air supply system,<br>• Importance of spraying material viscosity, Different ways to mix paint or other materials paint mixing sticks, viscometer, or viscosity cup,<br>• Effect on finish material temperature, film thickness,<br>• Spray gun setup- Air Supply Adjustments, Distance, Adjustment Knobs,<br>• Testing Spray Pattern, Effect of Spray on Gun stroke, Gun Speed, Gun Triggering, |

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| | | | • Gun Direction, Spray Overlap, Gun Handling Problems Heeling, Arcing.<br>• Spray Gun Maintenance spray gun cleaning tank, manual spray gun cleaning, spray gun lubrication,<br>• Other spray systems,-airless spray gun system, electrostatic spraying system, touch-up guns, airbrushes,<br>• Spray booths- one- and two-room spray booths, air makeup or air replacement system-Regular flow booth , Reverse flow booth, Cross draft booth, Downdraft booth, Air Filtration Systems- wet filtration system and the dry filtration system, spray booth maintenance.<br>• Description of drying room-types of infrared drying equipment- Near drying equipment. Far drying equipment.<br>• Description of Air-supplied respirators, type of air-supplied respirators- hood type and the face shield type.<br>• Other paint shop equipment and tools- wet sanding stand , Paint hangers, Panel drying ovens, Paint shakers, blade agitator, Churning knives, Paint scales, Paint cabinets, Tack cloths, purpose of strainer, Masking tape. |
| 59-66 | Identify & select correct paint spray techniques, paint problems and apply | **Paint spray technique, problems &troubleshooting (280 hrs)**<br>115. Perfection on an Air Spray Gun to achieve different spray | **Paint spray technique, problems & troubleshooting (30 hrs)**<br>• Probable causes and remedies<br>• Spray pattern top Spray |

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| | troubleshooting skills. | patterns viz. top heavy or bottom heavy, heavy to right or to left, heavy at center.<br>116. Able to spray avoiding split, pinholes, blushing or a whitish coat, orange peel (surface looks like orange peel).<br>117. Troubleshoot Excessive spray fog or over spray, No control oversize of pattern, Sags or runs.<br>118. Troubleshoot Streaks Gun sputters constantly, uneven spray pattern, fluid leaks from spray gun.<br>119. Troubleshoot fluid leaks from packing nut, fluid leaks through fluid tip when trigger is released.<br>120. Troubleshoot excessive fluid, fluid not coming out from spray gun, fluid not coming out from fluid tank or canister.<br>121. Troubleshoot Sprayed coat short of Liquid material, spotty, uneven pattern, slow to build, unable to get round spray, dripping from fluid tip.<br>122. Troubleshoot Excessive overspray, excessive fog, not spraying on pressure feed, not spraying on suction feed.<br>123. Troubleshoot Air continues to flow through gun when trigger has been released (on non bleeder guns only).<br>124. Troubleshoot Air leak at canister gasket.<br>125. Troubleshoot Leak at set screw in canister top, Leak between top of canister cover sand gun body. | pattern heavy to right or to left, Spray pattern heavy at center, Spray pattern split, Pinholes, Blushing or a whitish coat, Orange peel (surface looks like orange peel), Excessive spray fog or over spray, No control over size of pattern, Sags or runs, Streaks Guns putters constantly, Uneven spray pattern,<br>• Fluid leaks from spray gun, fluid leaks from packing nut, Fluid leaks through fluid tip when trigger is released, Excessive fluid, Fluid will not come from spray gun, Fluid will not come from fluid tank or canister,<br>• Sprayed coat short of liquid material, Spotty, uneven pattern, slow to build, Unable to get round spray, Dripping from fluid tip, Excessive overspray, Excessive fog, Will not spray on pressure feed, Will not spray on suction feed,<br>• Air continues to flow through gun when trigger has been released (on non bleeder guns only), Air leak at canister gasket, Leak at setscrew in canister top, Leak between top of canister cover and gun body. |

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| 67-72 | Plan & organize to explain & perform surface preparation and masking jobs using hand & Power tools for carrying out automotive body paint works. | **Surface preparation and masking (200 hrs)**<br>126. Checking of Paint Thickness (DFT) at different locations.<br>127. Paint removal using chemicals tripping, and media blasting.<br>128. Preparing of Bare Metal using metal conditioners.<br>129. Preparing of hard chrome Surfaces.<br>130. Preparation of metal for Replacement parts.<br>131. Apply spot putty, or glazing putty.<br>132. Perform final sanding, using the right grit, power sanding, hand sanding, dry sanding, wet sanding.<br>133. Carry out Surface Cleaning.<br>134. Mask the parts of a vehicle by using different masking techniques. | **Surface preparation and masking (20 hrs)**<br>• Importance of surface preparation, Evaluate Surface Condition, Checking Paint Thickness, Paint Removal method- Chemical stripping, Media blasting procedure for operating a blaster, type of grit and numbering system.<br>• Sanding or grinding, Importance of Preparing Bare Metal-using metal conditioners, preparing hard chrome Surfaces, preparing metal replacement parts, using self-etch primer, apply seam sealer<br>• Prime coat Selection, applying Prime coats<br>• Applying spot putty, or glazing putty.<br>• Final sanding, using the right grit, Masking, surface sanding methods, power sanding, hand sanding, dry sanding, wet sanding, comparison between wet and dry sanding, surface scuffing,<br>• Surface Cleaning. Masking, basic ways to mask the parts of a vehicle, liquid masking material, liquid masking system, Procedure, plastic sheet masking. Masking paper and tape, masking aids-wheel masks, masking panel gaps, masking openings, Reverse masking, or blend masking, Masking rope, (aperture tape), surface cleaning, using wax-and-grease remover. |

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| 73-80 | Identify functions of paint, OEM paint finishing &refinishing procedures, identify different types of paints and perform application of solvent based & plastic paints & polishing jobs. | **Refinishing Procedures (276 hrs)**<br>135. Identify different type of paint for top coat refinishing, paint used for refinishing.<br>136. Applying of Prime coats<br>137. Refinishing/Painting/ repairing of plastic parts by applying Basecoat/ Clear coat.<br>138. Apply Single Stage Paints<br>139. Perform overall refinishing of panels.<br>140. Removal of Masking Materials.<br>141. Polish the painted panels.<br>142. Comply with safety rules when performing the above operations. | **Refinishing Procedures (30 hrs)**<br>• Functions of paint<br>• OEM paint finishes procedures, different between OEM and refinish painting types of paint for top coat refinishing.<br>• Properties of paint use for refinishing.<br>• Topcoats, Prime coats, Preparing Refinish Materials,<br>• Pre-painting Preparations, Applying Prime coats.<br>• Refinishing Plastic Parts, Flash Times, Basic Spray Coats.<br>• Methods of Refinishing, Base coat/ Clear coat Repairs,<br>• Applying Single Stage Paints, Panel Repairs.<br>• Overall Refinishing, Removal of Masking Materials. |
| 81-89 | Explain color theory & color evaluations in different lights, identify color adjustments, Perform color mixing (tinting) using computerized color matching systems, spraying Metallic colors and conduct color analyzing. | **Paint color Problems and Top coat paint layer correction (297 hrs)**<br>143. Remove foreign matter from wet paint.<br>144. Perform wet sanding between coats.<br>145. Correcting of paint colour mismatch, orange peel, runs and sags, sand scratch, swelling, bull's-eye featheredge, featheredge splitting, water spotting, chemical spotting, curing or drying failure, paint fisheyes, blushing, bleeding, prime coats how-through, blistering, solvent popping, paint cracking, line checking, crazing, micro checking, lifting, paint wrinkling, mottling, pin holing, peeling, chalking, paint colour fade, dulled finish, | **Paint color Problems and Top coat paint layer correction (30 hrs)**<br>• Repairing Paint Problems-problems in wet paint, removing foreign matter in wet paint, wet sanding between coats,<br>• Causes, prevention and correcting of paint colour mismatch, orange peel, runs and sags, sand scratch swelling, bull's-eye featheredge, featheredge splitting, water spotting, chemical spotting, curing or drying failure, paint fish-eyes, blushing, bleeding, prime coat show through, blistering, solvent popping, paint cracking, line checking, crazing, micro checking, lifting, |

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| | | debris in the finish, rust under the finish.<br>146. Repairing paint runs and chipped paint.<br>147. Evaluate the painted surface or detailing.<br>148. Visualising of painted surface in three different angles for final detailing.<br>149. Paint defect identification and are a wise defect ranking and tolerance. | paint wrinkling, mottling, pin holing, peeling, chalking, paint colour fade, dulled finish, debris in the finish, rust under the finish.<br>• **Final detailing-** Detail sanding procedure, Repairing paint runs, repairing chipped paint, panel details an ding procedure, Paint compounding- purpose, rubbing compound, machine compounding, using buffers and polishers, avoiding paint burn-through, machine buffing procedures, hand and machine Glazing and polishing procedure, Final cleaning, steps for caring for a new finish. |
| 90-93 | Wood Surface Painting & Varnish Painting. | **Wood surface Materials (130 hrs)**<br>150. Identify various type of masking wood application material available.<br>151. Property of Wood compared to metal, Wooden Surface Preparation before painting.<br>152. Wood Surface Preparation before Polishing/ Vanishing procedure, Step BY Step Putty application and key points to be followed, Varnish, Types of Varnish, Difference between Painting and Varnishing. | **Wood surface Materials (20 hrs)**<br>• Identify the different type of finishing material- Primer, putty, paint binders, paint solvents, Paint additives.<br>• Select the right materials for a particular job or stage.<br>• Select the right type of primer and paint.<br>• Identify various type of masking material available.<br>• Identify different type of wood filler.<br>• Identify various type of abrasive materials i.e. grit rating available in the market and uses. |
| 94-102 | Apply basic understanding in the quality and quality concepts. Identify the quality and testing of paints. | **Quality methodology. (297 hrs)**<br>153. Tack Free (only top layered dried), Surface Dry(dried not enough to apply another coat)<br>154. Balanced-beam scrape-adhesion test. | **Theory Quality Concepts. (30 hrs)**<br>• Identify the quality standards with different accept, and understand the importance of the quality standard. |

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| | Distractive and non-distractive quality test methods of paint surface. | 155. Conical and Cylindrical bending machine, Cupping tester Fischer scope<br>156. Viscometer, Ford Cup is measuring instrument used to determine a fluid's internal flow resistance.<br>157. Gloss meter ( The instrument is used to measure the specular reflection of a surface)<br>158. Spectrophotometer (It is a three-channelled device that sees color exactly like the human eye.)<br>159. Bristle Test (the test will measure contamination of water soluble salts and corrosion products on blast cleaned steel , Salt spray test<br>160. Opacity tester -(contrast ratio - method). Clarity meter Pigment Dispersion test | • Different types of surface test and know the types with process are test.<br>• Understanding of ASTM standard (American society for testing and materials.<br>• ASTM process and standards.<br>• Distractive method test<br>• Non-distractive test<br>• Chemical resistance test<br>• Paint industry requirements and expectation.<br>• The widely used standard specification for steel painting.<br>• Surface protective coat testing methods. |
| 103-104 | **Revision and Project work (25 hrs)**<br>**Test/Examination 40 Hours** | | |

# 9. SYLLABUS - CORE SKILLS

## 9.1 WORKSHOP CALCULATION &SCIENCE

| S No. | Workshop Calculation | Workshop Science |
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| **FIRST YEAR – 75 Hr** | | |
| 1. | **Unit**: Systems of unit- FPS, CGS, MKS/SI unit, unit of length, Mass and time, Conversion of units | **Material Science**: 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. |
| 2. | **Fractions:** Fractions, Decimal fraction, L.C.M., H.C.F., Multiplication and Division of Fractions and Decimals, conversion of Fraction to Decimal and vice versa. Simple problems using Scientific Calculator. | **Mass, Weight and Density**: Mass, Unit of Mass, Weight, difference between mass and weight, Density, unit of density, specific gravity of metals. |
| 3. | **Square Root:** Square and Square Root, method of finding out square roots, Simple problem using calculator. | **Speed and Velocity**: Rest and motion, speed, velocity, difference between speed and velocity, acceleration, retardation, equations of motions, simple related problems. |
| 4. | **Ratio & Proportion**: Simple calculation on related problems. | **Work, Power and Energy**: work, unit of work, power, unit of power, Horse power of engines, mechanical efficiency, energy, use of energy, potential and kinetic energy, examples of potential energy and kinetic energy. |
| 5. | **Percentage:** Introduction, Simple calculation. Changing percentage todecimal and fraction and vice-versa. | |
| 6. | **Algebra**: Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables). | **Heat & Temperature**: 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. |
| 7. | **Mensuration :**Area and perimeter of square, rectangle, parallelogram, triangle, circle, semi circle, Volume of solids – cube, cuboid, cylinder and Sphere. Surface area of solids – cube, cuboid, cylinder | **Basic Electricity**: Introduction, use of electricity, how electricity is produced, Types of current - AC, DC, their comparison, voltage, resistance, their units. Conductor, insulator, Types of connections – series, parallel, electric power, Horse power, energy, unit of electrical energy. |

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| | and Sphere. | |
| 8. | **Trigonometry:** Trigonometrical ratios, measurement of angles. Trigonometric tables | **Levers and Simple Machines:** levers and its types.<br>Simple Machines, Effort and Load, Mechanical Advantage, Velocity Ratio, Efficiency of machine, Relationship between Efficiency, velocity ratio and<br>Mechanical Advantage. |
| **SECOND YEAR – 75 Hr** | | |
| 1. | Geometrical construction & theorem: division of line segment, parallel lines, similar angles, perpendicular lines, isosceles triangle and right angled triangle. | - Forces definition.<br>- Compressive, tensile, shear forces and simple problems.<br>- Stress, strain, ultimate strength, factor of safety.<br>- Basic study of stress-strain curve for MS. |
| 2. | - Area of cut-out regular surfaces: circle and segment and sector of circle. | - Temperature measuring instruments.<br>- Specific heats of solids & liquids. |
| 3. | - Area of irregular surfaces.<br>- Application related to shop problems. | - Thermal Conductivity, Heat loss and heat gain. |
| 4. | - Volume of cut-out solids: hollow cylinders, frustum of cone, block section.<br>- Volume of simple machine blocks. | - Average Velocity, Acceleration &Retardation.<br>- Related problems. |
| 5. | - Material weight and cost problems related to trade. | - Circular Motion: Relation between circular motion and Linear motion, Centrifugal force, Centripetal force |
| 6. | - Finding the value of unknown sides and angles of a triangle by Trigonometrical method. | - Friction- co-efficient of friction, application and effects of friction in Workshop practice.<br>- Centre of gravity and its practical application. |
| 7. | - Finding height and distance by trigonometry. | - Magnetic substances- natural and artificial magnets.<br>- Method of magnetization. Use of magnets. |
| 8. | Application of trigonometry in shop problems. (viz. taper angle calculation). | - Electrical insulating materials.<br>- Basic concept of earthing. |
| 9. | **Graph:**<br>- Read images, graphs, diagrams bar chart, pie chart.<br>- Graphs: abscissa and ordinates, graphs of straight line, related to two | - Transmission of power by belt, pulleys & gear drive.<br>- Calculation of Transmission of power by belt pulley and gear drive. |

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| | sets of varying quantities. | |
| 10. | Simple problem on Statistics:<br>- Frequency distribution table<br>- Calculation of Mean value.<br>- Examples on mass scale productions.<br>- Cumulative frequency<br>- Arithmetic mean | - Heat treatment and advantages. |
| 11. | Acceptance of lot by sampling method (within specified limit size) with simple examples (not more than 20 samples). | Concept of pressure – units of pressure, atmospheric pressure, absolute pressure, gauge pressure –gauges used for measuring pressure Introduction to pneumatics &hydraulics systems. |

## Syllabus – Engineering Drawing

**Engineering Drawing (For First & Second year) Under CRAFTSMAN TRAINING SCHEME (CTS) (For all Engineering Trades duration) will be followed.**



## 9.2 EMPLOYABILITY SKILLS

| First Year- 120 Hr. | |
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| **Module** | **Topics** |
| **1. Behavioral Skills** | **Duration:10 Hr.** |

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| | **Marks:** |
| **Expectation Setting** | Creating a focused and responsible learning environment |
| **Personal Strength Analysis/ Strength Blindness** | Self –awareness and confidence building |
| **Perception Management** | Display Professionalism at the institute and workplace |
| **Ethics, Values & Etiquette** | Increased social initiations relationships and networks<br>Acceptance of peers from different cultures and social groups and work with them.<br>Collaboration with team to prioritize the common goal and compromise individual priorities. |
| **Social Etiquette** | Characteristic of a responsible citizen- Display the same by respecting self, others, environment, care for duty and value for time. |
| **Role Modeling** | Adopting best practices and aspire to follow success stories of individual for personal development. |
| **2. English Literacy** | **Duration: 20 Hr.**<br>**Marks:** |
| **Functional English** | Importance of Learning English<br>Different Naming words, Words used for replacing names, Action words, Describing people, place and their use.<br>Introduction to punctuation -Comma, Full stop, Question mark. Singular plural<br>Change of tense- Simple present, past; present, past progressive<br>Construction of simple sentences-Kinds of sentences Usage of appropriate words to express themselves Greetings & Self Introduction<br>Asking & responding to questions<br>Sharing information with others<br>Formal & Informal communication<br>Speak and provide information about workplace<br>Discussions on current happenings. |
| **Reading** | Reading simple sentences about:<br>a) Self<br>b)Work<br>c)Environment |
| **Written English** | Simple writing skill |
| **3. Communication Skills** | **Duration: 10 Hr.**<br>**Marks:** |
| **Self-Introduction** | Interview Skills/Confidence Building |

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| **Perception Management** | Professionalism and Display of same at the institute and workplace |
| **a. Verbal Communication** | Understand the usage of appropriate words to express themselves<br>Communicate effectively on telephone. |
| **b. Non-Verbal Communication** | Manage Personal Hygiene and Presentation |
| | Positive body language: adopt and use it appropriately to build a positive<br>Impression |
| | Different spatial zones: Understanding and need to maintain it, create safe zones for communication |
| | Maintaining appropriate eye-contact in building trust and confidence |
| | Impact of touch in a formal environment.<br>Acceptable and unacceptable touch. |
| | Role of tone in any communication. |
| **Campus to Work** | Time Management and Planning Skills |
| | Interview skills- its phases & ways to crack interview. |
| | Handling setbacks/rejection and recover from it with an action plan. |
| | Developing strong professional contacts/network to gain support in learning<br>Process and career as a whole. |
| **4. I.T. Literacy** | **Duration: 20 Hr.**<br>**Marks:** |
| **Basics of Computers** | Introduction to Computers and its applications. Hardware and peripherals.<br>Starting and shutting down of computer. Basic of computer Networks. |
| **Operating System** | Basics of Operating System. Types of Operating Systems. User interface of Windows 10 OS/latest. Create, Copy, Move and delete Files and Folders. Use of External memory like pen drive, CD, DVD etc, Introduction to in built windows apps, Tools and features. |
| **MS-Word** | Basic operating of Word Processing. Creating, opening and closing<br>Documents. Use of shortcuts, Creating and Editing of Text, Formatting the Text. Creating simple document like-resume, letter writing, job application etc., Printing document. |
| **MS-Excel** | Basics of Excel worksheet & its importance. Creating simple worksheets.<br>Adding and average functions. Printing of simple excel sheets. |

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| **Web browsers & Search Engines** | Introduction to world wide web (WWW), Useful websites, web browser- usage, search engine etc. Using popular sites like Bharat Skills, Skill Training related Government portals, naukri.com and other job portals, CITS applications, Apprenticeship portal (NAPS), resize images, signing up, Online fund transfer using UPI gateway. | |
| **Email** | Creating & using an email account–like Gmail or any other.<br>Usage of CC & BCC. Attaching documents<br>Checking email and composing Email. | |
| **Mobile application** | Scanning QR/AR code, Sharing best practices and downloading trade related videos using Wi-Fi, Fund transfer through App like BHIM | |
| **5. Entrepreneurship Skills** | | **Duration:10Hr.**<br>**Marks:** |
| **Entrepreneur** | Need of becoming entrepreneur. | |
| | Ways to become a good entrepreneur. | |
| | Enabling environment available to become an entrepreneur.<br>Different Govt. institutions/schemes promoting Entrepreneur viz., Gram in banks, PMMY-MUDRA loans, DIC, SIDA, SISI, NSIC, SIDO.<br>Ways to set up an enterprise and different aspects involved viz., legal compliances, Marketing aspect, Budgeting, etc.<br>Day to day monitoring mechanism for Maintaining an enterprise. Different Government schemes supporting entrepreneurship. Examples of successful and unsuccessful entrepreneurs. | |
| **6. Maintaining Efficiency at Workplace** | | **Duration: 10Hr.**<br>**Marks:** |
| **Maintaining Efficiency at Workplace** | Factors affecting productivity | |
| | Improving Productivity | |
| | Personal finance literacy Planning, Saving, Tax, Govt. schemes for financial safety e.g. Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY), etc. | |
| **7. Occupational Safety, Health and Environment Education** | | **Duration: 10 Hr.**<br>**Marks:** |
| **Safety and Health** | Introduction to Occupational Safety & health at workplace, Occupational<br>Hygiene | |
| **Occupational Hazards** | Basic Hazards. Chemical, Physical (Electrical, Temperature, Illumination)<br>Ergonomic, Biological, Vibro acoustic, Mechanical, Psychosocial | |
| **Accident and Safety** | Different types of Personal Protective Equipment (PPE). Accident | |

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| | Prevention techniques. |
| **First-aid** | Care of injured & Sick at the workplace. First-Aid & Transportation of sick person. |
| **Basic provisions on safety And Health** | Basic provisions of safety & health |
| **Environmental Issues** | Introduction to Environment, ecosystem and factors causing imbalance<br>Pollution and pollutants include liquid, gaseous, solid and hazardous waste Protecting the environment-Energy Conservation, groundwater, global warming.<br>Responsibility about the environment<br>Segregation and disposal of waste |
| **Environmental ethics** | Different actions people that affect others and the environment. |
| **Disaster Management** | Types, causes & effects, are as in India that are prone to be affected, preparedness & mitigation, dos and don'ts-Before, During and After any Disaster, how to reduce man-made disasters. |
| **8. Essential skills for success** | **Duration: 10Hr. Marks:** |
| **Essential skills for success** | Building basic skills to navigate life and career.<br>Self-Awareness, articulating personal values, Value-based decision making, Dilemma situations.<br>Identify sources and types of stress (positive/negative stress), Managing stress (long-term/ short-term), Handling rejection and building resilience, Identify day wasters. |
| **9. Labour Welfare Legislation** | **Duration: 05Hr. Marks:** |
| **Labour Welfare Legislation** | Benefits guaranteed under various acts-Factories Act, Apprenticeship Act,<br>Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act, POSH. Interpret applicable labour and industrial laws. |
| **10.Quality Management** | **Duration: 05Hr. Marks:** |
| **Quality Concept and Consciousness** | Create awareness on introduction of quality Concepts. |
| **Concept of Quality Management(QMS)& PDCA** | Concept of Quality Management (QMS), PDCA, Fishbone, 5S, 5D, KAIZEN |
| **Concept of ISO** | Introduction of ISO |
| **11. Preparation to the world of work** | **Duration: 05 Hr.** |

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| | | **Marks:** |
| **Career Plan** | Identify the difference between job and career | |
| **Basic Professional Skills** | Job roles available in respective trades | |
| **Career Pathways** | Awareness of industries, and the respective professional pathways | |
| **Search and apply for a job** | Awareness of higher education/up skilling (short-term) options Steps involved in online application for Instructor course, Apprenticeship and different jobs in popular site like the indiajobs.com, naukri.com, monsterindia.com, Govt. website. | |
| **12.CustomerInteraction/ service** | | **Duration: 05 Hr. Marks:** |
| **Greeting customers** | Forms of greeting | |
| **Probing-understanding Customer requirements** | Use of positive body language | |
| **Handling grievances** | Handling grievances (Use of ask-listen-repeat technique) | |
| **Relationship building with customers** | Relationship building with customers, importance of probing. | |
| **To identify the importance of probing** | Use of open-ended/close-ended questions to gauge requirement | |

| **Second Year-60 Hr** | | |
|---|---|---|
| **Module** | **Topics** | **Methodology** |
| **1. English Literacy** | | **Duration: 20Hr. Marks:12** |
| **Me/Myself, We/Ourselves** | Greetings Introducing yourself Talking about your family Likes and dislikes | Student speaks & writes 1 paragraph about themselves |
| **Role Models** | Introduce their role model Discuss strength and weakness/ criticism etc. Adjectives, verbs, pronouns etc. all covered. Write-up about this person | Group activity–who are the role models of each group. Displayed on a chart with pictures and text– make a collage and present. |
| **My Society** | Describe your surrounding Changes in your environment Dos and dont's Dumping of garbage Use of plastic Water conservation Strength and weakness Roads /pollution Gardens | Summarizing the discussion Pictures of something in the past/ what it is now |
| **My Interests** | Theme parks Historical areas/cities (places) Adventure–sea, mountain, beaches Hobbies | Student speaks about their favorite place/area of interest/ hobby and why they like it |

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| **My Work** | What they want to do<br>Why they want to do it<br>What do they know about this opportunity<br>Competition/sector | Bring a newspaper clipping/news item of that industry and discuss it [individual activity–everyone has to talk about it and write about it] |
| **App based Learning** | Actual speaking practice–all 4 skills tested Gamified<br>Vernacular Capability Mapped to what is covered in class<br>Benefits Interactive<br>Self-confidence<br>High engagement | App based learning practice by the trainee using popular apps available |
| **2. Communication Skills** | | **Duration: 10 Hr.**<br>**Marks: 12** |
| **Personal** | Reflection Template<br>Revision<br>Importance of Communication<br>Managing Emotions<br>Create online profile +Form al<br>Introduction of self (based on the industry) | Self-reflection-Pg193<br>Case study from the workplace-videos<br>Reflection on Industry visit<br>Digital practice + Classroom Practice |
| **Interpersonal** | Giving and Receiving Feedback<br>Communication based on context-Formal, Informal<br>Verbal & Non-verbal<br>Listening Skills<br>Gender Sensitivity<br>Application of Gender sensitivity | Burgar Feedback Template & Practice<br>Role play and Peer Evaluation<br>Role Play & Reflection<br>Gender Pledge |
| **Workplace Communication** | Interview Preparation (With Resume, Formal Dress)<br>Communication Etiquette:<br>a. Mobile Applications for the workplace<br>b. Fake News<br>Customer Interaction<br>a. Defining my customer(other department, client)<br>b. Communication based on the customer base<br>Workplace Communication- Peer, Superior, Junior | Career Day: Scenario based activity, with Guest Lecture or HR person Reflection of Market Scan Trade specific examples + Role play<br>Case Study, Role Play<br>Case Study, Digital practice via email |

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| | Formal Communication - Practice | |
| **3.I.T.Literacy** | | **Duration: 10Hr.**<br>**Marks: 10** |
| **MS-PowerPoint** | Basics -creating, opening, closing, slide show | ppt, audiovisual, task-based activities. |
| **File Conversion & Reducing file size** | Identify file types, types of files- pdf, jpg, doc, excel, ppt<br>Converting files to other types | ppt, demonstration & practice |
| **Data/webcasting Through mobile** | Casting desktop application or web application<br>By WIFI or Bluetooth | Demonstration &practice |
| **Server & cloud computing** | Introduction to server and cloud computing<br>accessing, storing and retrieving file through google drive | audio visual, task-based activity, demonstration |
| **Language translation** | Language translation through voice<br>Voice to text, text to voice application | task-based, demonstration |
| **Customize and use online CVs** | Access CV templates online<br>Customize CVs as per requirement | task-based, demonstration |
| **Artificial Intelligence** | latest technology based model or simulated software | Demonstration & practice |
| **4. Entrepreneurship Skills** | | **Duration: 10Hr.**<br>**Marks:6** |
| **Entrepreneurship Mindset** | Aspect of inspiring/motivating should be sprinkled across all topics.<br>Recall the qualities/characteristics.<br>Being a leader (your values, personal code of conduct)(ownership for my enterprise).<br>Listen, Learn and Observe (framework of an effective leader)<br>Grit (***Addressing difficulties/ challenges in an entrepreneur's life positively***) Managing personal time<br>***Focus on breaking myths related to entrepreneurship wherever possible.*** | Share experience of successful entrepreneurs (examples of alumni from ITI)(Can be given as an instruction to teachers) |
| **Opportunity** | Selection of type of business - | |

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| **identification** | Product/service/trading<br>UVP–unique idea about the business<br>Being environment friendly (to be touched upon in as many activities that learner is taking part in)<br>Reminder about Business model framework | Systems thinking and then doing market research (***related to innovation and problem solving done by other players in the market***) |
| **Being Resourceful** | Being resourceful<br>Identify ways of being resourceful– Inexpensive ways of marketing Networking<br>Importance of Networking (interpersonal skills, communication skills related activity)<br>How to connect (through Net and otherwise– bring in English and IT skills related activity) Business model revisit | communication skills related activity<br>project<br>English and IT skills related activity<br>Business model revisit<br><br>Connecting with likeminded people |
| **Ease of Doing Business** | Single window mechanism for running the business<br>How to apply for business, awareness of statutory compliances, and govt or non govt schemes<br>Business model revisit activity | learner can be directed to it through communication and inter personal focused activities |
| **Managing Resources** | Human resource (customers and internal employees or other entities in the business cycle)<br>Finance(activities to bring about importance of financial literacy)<br>Infrastructure (location, equipment, machinery etc.)<br>Use of Internet (importance of IT skills)Business model revisit activity | Activities will bring about Importance of communication and interpersonal skills |
| **Mentorship and Role Models** | Importance of mentorship<br>They will to look at mentors in their own ecosystem, connecting with them through Net or otherwise again. | Interpersonal skills, communication and IT skills can be reinforced |
| **Learning Cycle** | Business model revisit (it's an ever-evolving | Role Play/live demonstration |

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| | Model and you may need to revisit the model and different aspects of it along with your own capabilities, revisit mindsets frequently, being a lifelong learner by being aware of skills and attitudes displayed by other successful entrepreneurs. | Skills and attitudes displayed by other successful entrepreneurs |
| **5. Sustainable Career** | | **Duration:10 Hr.**<br>**Marks:10** |
| **Career Awareness** | Learn and explore upcoming advances in the industry<br>Students will be able to connect all the subsequent topics with real-life experience, and understand the importance of mastering career planning and readiness topics<br>Gain exposure to a modern workplace from his/ her industry | Webinar / online pre-recorded lectures from industry representatives. Visit / view a video on online portal /interact with industry experts. A video about the evolution of workplace in the past few years (past to future). The students must get a template to record the insights from the visit/interaction like a simple worksheet. |
| **Career Planning** | Learn and apply growth mindset to career planning<br>Ashok Leyland shares an example- they are undergoing an extensive tech. overhaul and technicians will have to learn new things to stay relevant/ updated in thei.r jobs.<br>Learn about personal skills and interests<br>Adapt to ever-changing business environment<br>Learn about continuous up skilling/ re skilling learning requirements in their industry<br>ITI students should be aware that their skilling<br>Journey will continue for life, and will not end with the end of final year.<br><br>Map career pathways within your sector | Case studies / self-awareness activities/ mapping the barriers to growth mind set in everyday life, and devising strategies to apply growth mindset through easy-to- implement actions every day.<br>Write 16PF, or other relevant personality tests that gives students an insight into their strengths, and also provides them a vocabulary to express their personal strengths and interests<br>Case studies/team work activities to practice adaptability/ working in ambiguity /openness to change in industry.<br>Online job search / advanced market scanning related to their chosen sectors- update your year 1market scan.<br>Within the same market scan activity-explore both-jobs and self-employment opportunities Share a |

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| | | template on which students can envision their future of work - identify what your workplace looks like today - through market research, online content etc. and what it will look like in a decade.<br>QA has developed videos on how new jobs will look different from today's jobs. Anticipate challenges (apprenticeships, untimely termination, location of job-be open to migration, assess cost of living etc.) Common future plan template –for planning a self- employment journey/career options<br>Share relevant keywords / direction for conducting a career pathway search for each trade |
| **Career Readiness** | Practice writing technical evaluations / aptitude test.<br>Communicate their fit (positive attitude /adaptability/self-led learner) during the interview.<br>Final year students are placement read. Hence, placement preparation. Prepare and review final resume. Identify and apply for apprenticeships on NAPS.<br>Register on government job portals (national and state).<br>Learn and apply for DST / internship opportunities.<br>Apply for jobs (practice reading key words in job descriptions, understand salaries and benefits)<br>Request and receive feedback to improve performance.<br>Develop cultural intelligence.<br>Respecting gender equality at workplace. Cultivating professional attitude.<br>Apply green practices in life and | Conduct a mock interview exercise involving a panel, which includes industry representative, college faculty, HR (desired)<br>Scores/internship experience etc. is most relevant<br>Employment Exchange / Youth Employability Services<br>What is an internship? Structured and unstructured. State Skill Development Missions portals.<br><br>Respecting my time/others time, work/life balance, cooperativeness/ quality conscious /teamwork/empathy /commitment/ deliver on time. |

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| | career. | |
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## ANNEXURE-I

| List of Tools and Equipment | | | |
|---|---|---|---|
| **Automotive Paint Technician (For batch of 20 candidates)** | | | |
| **S No.** | **Name of the Tools and Equipment** | **Specification** | **Quantity** |
| **A. TOOLS, EQUIPMENT & GENERAL OUTFIT** | | | |
| 1. | Paint booth | 10mtr*6mtr | 1 |
| 2. | I R Oven | 7mtr* 3mtr | 1 |
| 3. | Caliper inside | 15 cm Spring | 10 |
| 4. | Sponge tack Rags | 50*100*150MM | 10 |
| 5. | DFT meter | Metal thickness | 2 |
| 6. | Chamois Cloth | | 10 |
| 7. | Putty mixing board, | 200mm *250mm | 10 |
| 8. | Putty applicator/knife | | 10 |
| 9. | Calipers outside | 15 cmspring | 10 |
| 10. | Center Punch | 10 mm. Dia. x100mm. | 10 |
| 11. | Different type of spoon | | 10 |
| 12. | Dividers15cmSpring6 | 15 cm Spring | 2 |
| 13. | Electrician Screw Driver | 250mm | 2 |
| 14. | General purpose dolly | Material transport | 1 |
| 15. | Hammer ball peen | 0.5kgwithhandle | 10 |
| 16. | Hands file | 20 cm. Second cut flat | 10 |
| 17. | Paint scrapper | Metal knife | 10 |
| 18. | Pliers combination | 20 cm. | 10 |
| 19. | Safety glasses | | 20 |
| 20. | Screwdriver | 20cm.X9mm.Blade | 10 |
| 21. | Allen Key set | 12 pieces(2mmto14mm) | 10 |
| 22. | Scriber | 15 cm | 10 |
| 23. | Bucket, | 10 to 15 ltr | 10 |
| 24. | Spanner, ring set | 12 metricsizes6to 32mm. | 10 |
| 25. | Spanners socket with speed handle | Set of 28 pieces with box | 5 |

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| 26. | Steel rule | 30 cm inch and metric | 20 |
| 27. | Steel tool box | 400x200x150mm | 1 |
| 28. | Toe dolly | | 10 |
| 29. | Wire cutter and stripper | | 10 |
| 30. | Adjustable spanner | (pipe wrench 350 mm) | 2 |
| 31. | Air blow gun with standard | | 5 |
| 32. | Air ratchet with standard accessories | | 2 |
| 33. | Allen Keyset | 12 pieces(2mmto14mm) | 6 |
| 34. | Hand block | 150mm | 10 |
| 35. | Hand block | 300mm | 10 |
| 36. | Single action sander | 50 R | 10 |
| 37. | Double action sander | 50 R | 5 |
| 35. | Double action sander | 150 R | 10 |
| 36. | ES GUN | electric | 4 |
| 38. | Pressure part | Paint store | 2 |
| 39. | Air hose set | 10mm diameter | 10 |
| 40. | Spray gun | Wider 100 | 10 |
| 41. | Spray gun | Wider 200 | 10 |
| 42. | Gravity spray gun | | 4 |
| 43. | Ford cup | #3 | 1 |
| 44. | Ford cup | #4 | 1 |
| 45. | Thermometer | | 1 |
| 46. | Humidity thermometer | | 1 |
| 47. | Wave scanner | | 1 |
| 48. | Color matching shade cards | | 2 set |
| 49. | Spray stand | Panel hanging | 20 |

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| 50. | Spray stand X type | Plastic part painting | 5 |
| 51. | Sun lamp | Scan grip | 1 set |
| 52. | Spray Gun cleaning kit | | 2 Set |
| 53. | Shell body | Any model | 1 |

**ANNEXURE - II**

| TRAINEE INTERNAL ASSESSMENT REPORT | | | | | | | |
|---|---|---|---|---|---|---|---|
| Name: | | | | | Batch No.: | | |
| Card ID No. | | | | | Dept: | | |
| Attendance %: | | | | | Trade: | | |
| **Quarters** | **Month** | **Attend %** | **Month** | **Attend %** | **Month** | **Attend %** | **Quarterly Average Attend %** |
| Qtr – 1 | | | | | | | |
| Qtr – 2 | | | | | | | |
| Qtr – 3 | | | | | | | |
| Qtr – 4 | | | | | | | |

**General Assessment**

| Sl No. | Attributes | | Score Qtr - 1 | Score Qtr - 2 | Score Qtr – 3 | Score Qtr - 4 | Score Sum of 4 Qtr Qtr – Sum |
|---|---|---|---|---|---|---|---|
| 1 | Safety | Knowledge, follow safety precautions and rules | | | | | |
| 2 | Sense of Responsibility | Does he obey Sup/Line i/c instructions | | | | | |
| | | Does he attend shift start meetings regularly | | | | | |
| | | Does he take supervisors feedback properly | | | | | |
| | | Whether he takes planned leaves | | | | | |
| | | Does he participates in new drives | | | | | |
| | | Does he take care in handling tools | | | | | |
| | | Is Punctual | | | | | |
| | | Positive, Behaviour , response, learning | | | | | |
| | | Maintain 5S at his work station | | | | | |
| | | Co-operation - Consider team work, willingness to work with and for others | | | | | |
| | | Able to identify and report irregularities at his work place | | | | | |
| 3 | Method | Follow WIS/MOS | | | | | |
| | | Able to check faults of previous station | | | | | |
| | | Understands tools/equipment functions and its different parts | | | | | |
| | | Able to perform the job independently | | | | | |
| 4 | Speed | Able to match line "TACT" time | | | | | |
| | | Willingness to learn/flexibility for alternate job | | | | | |
| | | Work completion/target achievement | | | | | |
| 5 | Quality | Able to contain defects | | | | | |
| | | Awareness about GCA/PDI | | | | | |
| | | Skill acquired during "On job training" | | | | | |
| | | **Total Score** | | | | | |
| | | **Max Marks.** | | | | | |

(Fill score in relevant box) Excellent: 4, Very Good: 3, Good: 2, Fair: 1, Need Improvement: 0

| **Remarks (Supervisor):Mention Achievement / Critical Incidents** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **Remarks (Shift In charge / Dept Manager)** | | | | | | | |
| | | | | | | | |
| **Remarks (ITP Training Coordinator)** | | | | | | | |
| | | | | | | | |