

CURRICULUM

FOR THE TRADE OF

Mechanic Auto Body Painting

UNDER

DUAL TRAINING SCHEME

2017

BY



Government of India

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

PROPOSED TIME DISTRIBUTION FOR MECHANIC AUTO BODY PAINTING
TRADE UNDER DUAL TRAINING SCHEME

| BLOCK WITH DURATION | THEORY | PRAC. | WSC/ CAL | ENGG. DRG. | EMP.S KILL | ECA, LIB. & OTHERS | REM. |
|--|----------------|---|---------------------|-----------------------|-----------------------|---------------------------------------|---------------------------------------|
| BLOCK – I (05 months/ 22 Weeks duration) Institute level trg. | 230hrs. | 300 hrs. | 80 hrs. | 120 hrs. | 100hr s. | 10 hrs. | 40 hrs. Revision & Test |
| BLOCK – II (05 months / 22 weeks duration) Industry level trg. | --- | 880hrs. | --- | --- | --- | --- | --- |
| BLOCK – III (2 months/ 8 Weeks duration) Institute level trg. | 90 hrs. | 114 hrs. (Practical practice and submission of report related to industry training) | 30hrs. | 30hrs. | 10 hrs. | 06 hrs. | Last 1 week revision & exam. |
| GRAND TOTAL | 320hrs. | 1294hrs. | 110 hrs. | 150 hrs. | 110 hrs. | 16hrs. | 80 hrs. |
| Total duration of training inclusive of Industry & Institute is 1 years (2080 hrs.) | | | | | | | |

GENERAL INFORMATION

- 1. Name of the Trade** : **Mechanic Auto Body Painting (Dual Mode)**
- 2. N.C.O. Code No.** : 7132.0201, 7132.0202, 7132.0901
- 3. Duration of Craftsmen Training** : 12 months (Three Blocks).
- 4. Power norms** : 4.8 KW
- 5. Space norms** : 210 Sq. mtr. (Including Parking Area)
- 6. Entry Qualification** : Passed 10th class examination with maths and Science.
- 7. Unit size (No. of student)** : 16 (Max. Supernumeraries: 5)
- 8a. Qualification for Instructor** : Degree in Automobile/ Mechanical Engg. (with specialization in Automobile) from recognised college/University with one year experience in the automobile Body/painting industry and should possess valid LMV driving license.
OR
Diploma in Automobile/Mechanical (specialization in automobile) from recognized board of technical education with two years experience in the automobile Body/painting industry and should possess valid LMV driving license
OR
10th Passed + NTC/NAC in the Trade of "Mechanic Auto Body Painting" with 3 years post qualification experience in the relevant field and should possess valid LMV driving license
- 8b. Desirable Qualification** : With "National Crafts Instructor Certificate".

Note:

- (i) Out of two Instructors required for the unit of 1+1, one must have Degree/Diploma and other must have NTC/NAC qualifications.
- (ii) Instructor qualification for W/shop Calculation, Engg. Drawing & Employability Skill would be as per the training manual.

Distribution of training on Hourly basis:

| Total hours /week | Trade practical | Trade theory | Work shop Cal. &Sc. | Engg. Drawing | Employability skills | Extra curricular activity |
|-------------------|-----------------|--------------|---------------------|---------------|----------------------|---------------------------|
| 40 Hours | 25 Hours | 6 Hours | 2 Hours | 3 Hours | 2 Hours | 2 Hours |

SYLLABUS CONTENT WITH TIME STRUCTURE FOR "MECHANIC AUTO BODY PAINTING" TRADE

Block – I

Duration- 05 Months (22 Weeks /880Hrs.)

Institute Level Training: -

| Sl. No. | Practical | Theory |
|---------|---|---|
| 1. | <p>Induction training:</p> <ul style="list-style-type: none"> - Familiarisation with the Institute. - Importance of trade Training - Machinery used in the trade. <p>Practical related to Safety and Health, Importance of maintenance and cleanliness of Workshop. Interaction with health center and fire service station to provide demo on First aid and Fire safety, Use of fire extinguishers. Energy saving Tips/Audit of ITI electricity Usage</p> | <p>General</p> <p>Occupational Safety & Health Importance of Safety and general Precautions to be observed in the shop. Basic first aid, safety signs - for Danger, Warning, caution & personal safety message. Safe handling of Fuel Spillage, Fire extinguishers used for Different types of fire. safe disposal of toxic dust, safe handling and Periodic testing of lifting equipment, Authorization of Moving & road testing vehicles, Energy conservation-Definition, Energy Conservation Opportunities(ECOs)-Minor ECOs and Medium ECOs, Major ECOs),</p> |
| 2. | <p>Practice using all marking aids, like steel rule with spring calipers, dividers, scribe, punches, Chisel etc., Layout a work piece- for line, circle, arcs and circles.</p> <p>Practice on General workshop tools & power tools and equipments.</p> | <p>Hand Tools</p> <p>Marking scheme, Marking material-chalk, Prussian blue. Cleaning tools- Scraper, wire brush, Emery paper, Description, care and use of Surface plates, steel rule, measuring tape, try square. Calipers-inside and outside. Dividers, surface gauges, scribe, punches-prick punch, center punch, pin punch, hollow punch, number and letter punch. Chisel-flat, cross-cut. Hammer- ball pein, 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, scratch awl, Screw drivers-blade screwdriver, Phillips screw driver, Ratchet screwdriver. Allen key, bench vice & C-clamps, Spanners-ring spanner, open end spanner & the combination spanner, universal adjustable open end spanner. Sockets & accessories, Pliers - Combination pliers, multi grip, long nose, flat-nose, Nippers or pincer pliers, Metal cutting shears- Tin snips, sheet metal cutting pliers, (Aviation snips), panel cutters, trim and</p> |

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| | | upholstery tools, Door handle tool (clip pullers), Metal files-reveal file, surform file, sanding board, sanding block, spreaders and squeegees. |
| 3. | Practice on General workshop tools & power tools and equipments. Practice on visual Identification of materials used in workshop. Trouble shooting for Air drills- Tool will not run, Tool locked up, spindle will not run, tool will not shutoff, Trouble shooting for Air hammers- tool will not run, chisel stuck in nozzle; Trouble shooting for Air ratchet- Motor runs, spindle does not turn or turns erratically, motor will not run, Trouble shooting for Air Wrenches- Tools run slowly & not at all, Tool will not run, exhaust air flows freely, socket will not stay on, tool shows premature shank wear, Tool will not shut off. Trouble shooting for hydraulic tools for- Spongy effect, Tool will not extend, Tool will not retract tool leaks under pressure, Handle kickback, works properly onetime but not the next. | Power Tools:- Air powered tools - Advantage over electrical powered tools, Construction and its parts of air spray gun, Air drill, air screw drivers, air sanders- disc type and dual action(finishing) sander, Different type of air grinders, air saw, air scraper, air shear, air nibblers, air chuck, air polishers/buffers, media blasting (sand blasting), plastic media blasting, soda blasters, maintenance of pneumatic tools. air impact wrench, air ratchet, air drill, spot weld remover air drill, spot weld cutter-drill type & Hole saw type, air chisel, air blowgun, Spray guns, wrenches- Torque wrenches, pipe wrenches, car jet washers Pipe flaring & cutting tool. Vacuum cleaner, power washers, Heat gun, Hydraulically powered shop equipment- Hand or bottle jacks, Transmission jack, service jack, Frame rack, Maintenance of hydraulic tools, hydraulic lifts. Engine crane. |
| 4. | Practice on General cleaning, checking and use of nut , bolts, & studs etc., Removal of stud/bolt from blind hole. | Fasteners- Study of different types of screws, nuts, studs & bolts, locking devices, Such as lock nuts, cotter, split pins, keys, circlips, lock rings, lock washers and locating where they are used. Washers & chemical compounds can be used to help secure these fasteners. Selection of materials for gaskets and packing, Description of Riveting tools |
| 5. | Practice on cutting tools like Hacksaw, file, chisel, OFF-hand grinding with sander, bench and pedestal grinders, safety precautions while grinding. Practice on Hacksawing and filing to given dimensions. | Cutting tools :- 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, OFF - hand grinding with sander, bench and pedestal grinders, safety precautions while grinding. Limits, Fits & Tolerances:-Definition of limits, fits & tolerances with examples used in auto components. |
| 6. | Practice on Marking and Drilling clear and Blind Holes, Sharpening of Twist Drills Safety precautions to be observed while using a drilling machine. Practice on Tapping a Clear and Blind Hole, Selection of tap drill Size, use of Lubrication. Use of tap extractor, Cutting Threads on a Bolt/ Stud. | Drilling machine -Description and study of Bench type Drilling machine, Portable electrical Drilling machine, drill holding devices, Drill bits. Taps and Dies: Hand Taps and wrenches, Calculation of Tap drill sizes for metric and inch taps. Different type of Die and Die stock. Screw extractors. |

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| | Adjustment of two piece Die. Reaming a hole/ Bush to suit the given pin/ shaft, scraping a given machined surface. | 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. |
| 7. | Practice on making Rectangular Tray. | Sheet metal - State the various common metal Sheets used in Sheet Metal shop. Sheet metal operations - Shearing, bending, Drawing, Squeezing. Sheet metal joints - Hem & Seam Joints Fastening Methods - Riveting, soldering, Brazing. fluxes used on common joints. Sheet and wire-gauges. The blow lamp- its uses and pipe fittings. |
| 8. | Practice in joining wires using soldering Iron, Construction of simple electrical circuits, Measuring of current, voltage and resistance using digital multimeter, practice continuity test for fuses, jumper wires, fusible links, circuit breakers. | Basic electricity, Electricity principles, Ground connections, Ohm's law, Voltage, Current, Resistance, Power, Energy. Voltmeter, ammeter, Ohmmeter Multimeter, Conductors & insulators, Wires, Shielding, Length vs. resistance, Resistor ratings |
| 9. | Identification of Hydraulic and pneumatic components used in vehicle. Overhauling of service (FRL) unit, Drain the air receiver and the moisture separator/regulator. | Pneumatic Symbols, Description and function of air Reciprocating Compressor. Function of Air service unit (FRL-Filter, Regulator & Lubricator). |
| 10. | Identification of different type of Vehicle. Demonstration of vehicle specification data; Identification of vehicle information Number (VIN). Demonstration of Garage, Service station equipments.- Vehicle hoists - Two post and four post hoist, Engine hoists, <u>Jacks</u> , Stands. Washing of vehicle. Identification of different type body, chassis, Drive lines. Identify the location of parts and panels. Practice on use of computer-based service information, service manuals, refinishing guides, vehicle dimension manual, color matching guides, parts interchange guides | 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. Brief description and uses of Vehicle hoists - Two posts and four posts hoist, Engine hoists, <u>Jacks</u> , Stands. Introduction to Engine: Vehicle construction Technology Definition of body shop, classification of body shop-Independent body shop, dealership body shop, specialty body shop. Description of vehicle Body and Chassis. Service information, Specifications, and Measurements. Study of Service Information, basic steps to using refinishing materials information, Vehicle paint code, study of service symbols, diagnosis charts, wiring diagram. |
| 11. | Identify the different type of refinishing material paint binders, paint solvents, paint additives. Select the right repair | Refinishing Materials:- Primer-sealer, top coats, paint material types- Lacquer, enamel, water base, Content of paint- |

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| | material for a particular job. | <p>paint pigments, paint binders, paint solvents, Paint additives, Definition of Drying, curing, flash, retarder, accelerator, catalyst, adhesion promoter, blending solvent, Toners, Primers & sealers- self-etching primer, UV primer Primer-surfacer, Epoxy primers, sealers, Other paint materials- prep solvent, flattener, fish-eye eliminator, flex agent, Antichip coating (Vinyl coating), Metal conditioner, Paint stripper, tack cloth, Different type of Body filler- body filler (plastic filler), light body filler, fiberglass reinforced body filler, cream hardeners, Fiberglass resin, Glazing putty, Masking materials- Masking paper, Primer masking paper, paint masking paper, masking plastic, masking tape, Fine line masks, Wheel masks. 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, Epoxies.</p> |
| 12. | Identify the different type of body filler, hardeners, and putties, used in industry. | <p>Using Body Fillers 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, preparation surface for filler, Ingredient, characteristics and application of body filler & putties, Mixing filler, kneading the hardener, mixing filler and hardener, Spreading body filler, Grating and Sanding Body Filler-grating the filler, coarse, sandy filler, blowoff sanding dust, 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. Rust repair procedures.</p> |
| 13. | Identify how an estimating guide gives part pricing and labour time information. | <p>Corrosion Protection 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, Estimating Repair Costs Description of estimate, Direct repair programs, Estimate time factor, work orders,</p> |

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| | | Using Estimate Guides, Part prices, Labor costs, Job overlap, and Included operation. |
| 14. | Demonstration using different Spray Guns. | <p>Refinishing equipment Technology</p> <p>Painting environment variable, Steps to keep dirt from finish during body repairs, Description of spray gun and its parts, basic stages of Atomization, High-Volume, Low-Pressure (HVLP) Spray Gun, 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.</p> <p>Spray gun air supply system, importance of spraying material viscosity, Different ways to mix paint or other materials paint mixing sticks, viscometer, or viscosity cup, effect on finish-material temperature, film thickness, spray gun setup- Air Supply, Adjustments, Distance, Adjustment Knobs, Testing Spray Pattern, Effect of Spray on Gun stroke, Gun Speed, Gun Triggering, Gun Direction, Spray Overlap, Gun Handling Problems - Heeling , Arcing , Spray Gun Maintenance- spray gun cleaning tank, manual spray gun cleaning, spray gun lubrication, other spray systems,- airless spray gun system, electrostatic spraying system, touch-up guns, airbrushes, spray booths- one- and two-room spray booths, air makeup or air replacement system-Regular flow booth , Reverse flow booth, Crossdraft booth, Downdraft booth, Air Filtration Systems- wet filtration system and the dry filtration system, spray booth maintenance, Description of drying room-types of infrared drying equipment- Near drying equipment. Far drying equipment.</p> <p>Description of Air-supplied respirators, type of air-supplied respirators- hood type and the face shield type.</p> <p>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.</p> |

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| 15. | Demonstrate Spray Gun Patterns | <p>Probable causes and remedies for Spray pattern top heavy or bottom heavy, Spray 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 overspray,</p> <p>No control over size of pattern, Sags or runs, Streaks Gun sputters constantly, Uneven spray pattern, 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, 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, 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.</p> |
| 16. | Practice on Surface Cleaning. Practice to mask the parts of a vehicle by using different masking techniques. | <p>Vehicle surface preparation and masking</p> <p>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. 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 Primecoat Selection, applying primecoats applying spot putty, or glazing putty. 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, 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, (aperature tape), surface cleaning, using wax-and-grease remover.</p> |

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| 17. | Identify different type of paint Removal of Masking Materials. | Refinishing Procedures: Functions of paint, OEM paint finishes procedures, different between OEM and refinish painting types of paint for topcoat refinishing, properties of paint used for refinishing. Topcoats, Prime coats, Preparing Refinish Materials, Pre-painting Preparations, Applying Prime coats, Refinishing Plastic Parts, Flash Times, Basic Spray Coats, Methods of Refinishing, Basecoat/Clearcoat Repairs, Applying Single Stage Paints, Panel Repairs, Overall Refinishing, Removal of Masking Materials. |
| 18. | Practice on colour evaluations using sunlight | Color matching and Customized painting Introduction, Color Theory, Lighting-colour evaluations using sunlight & colour corrected light bulb, dimensions of colour- Value—lightness or darkness, Hue—color, cast, or tint, Chroma—saturation, richness, intensity, or muddiness, standard colour chips, variance colour chips, Matching Basic Paint Colors- use of colour test panel, spray-out test panel procedure, color spraying variables in the shop, positive and Negative variable, matching solid colors and metallic finishes, Spraying Metallic Colours- Wet Coats of Metallic Colour, Dry Coats of Metallic Colour, importance of metallic colour mixed, Metallic Colour Variables to darken & lighten, steps for spot repair with a fluorine clearcoat system, procedure for a letdown test panel for a three-stage finish, method for a spot or partial repair on a three-stage paint system, steps for a panel repair with a multistage mica or pearl finish, mica mid-coat blending procedure for a three-stage paint, Tinting, basic reasons for tinting a paint colour, three angles to determine whether a colour adjustment is necessary, Spectrophotometer or electronic colour Analyzer, Computerized Paint Matching Custom Painting. |

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| 19. | Practice on visualising of painted surface in three different angles for final detailing. | <p>Paint Problems and Final Detailing</p> <p>Repairing Paint Problems-problems in wet paint, removing foreign matter in wet paint, wet sanding between coats, 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, paint wrinkling, mottling, pin holing, peeling, chalking, paint colour fade, dulled finish, debris in the finish, rust under the finish. Final detailing- Detail sanding procedure, Repairing paint runs, repairing chipped paint, panel detail sanding 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.</p> |
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NOTE: - Maximum uses of video demonstration and other IT based teaching aids may be adopted to deliver the theoretical knowledge.

Syllabus for

EMPLOYABILITY SKILLS

GENERAL INFORMATION
(Employability Skill)

1. **Name of the subject** : **EMPLOYABILITY SKILLS**
2. **Hours of Instruction** : 110 Hrs.
3. **Examination** : The examination will be held at the end of the training.

4. **Instructor Qualification:**

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 DGET institutes

AND

Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above

OR

Existing Social Studies Instructors duly trained in Employability Skills from DGET institutes

5. **Instructor:**

One full time regular instructor shall be engaged on every 240 numbers of trainees for teaching the subject "Employability Skills". One additional full time regular instructor would be required on increase in every 240 trainees. Wherever the trainees are less than 240 or part thereof, a part-time instructor may be engaged to teach the subject.

ALLOTMENT OF TIME AND MARKS AMONG THE TOPICS

| Sl. No. | Topics | Allotted Hours | Marks Allotted | To be covered in |
|----------------|--|-----------------------|-----------------------|-------------------------|
| 1. | English Literacy | 20 hrs. | 9 | Block - I |
| 2. | I.T. Literacy | 20 hrs. | 9 | |
| 3. | Communication Skills | 15 hrs. | 7 | |
| | SUB TOTAL: | 55 | 25 | |
| 4. | Entrepreneurship Skills | 15 hrs. | 6 | |
| 5. | Productivity | 10 hrs. | 5 | |
| 6. | Occupational safety , health and Environment Education | 15 hrs. | 6 | |
| 7. | Labour Welfare Legislation | 05 hrs. | 3 | |
| 8. | Quality Tools | 10 hrs. | 5 | |
| | Sub Total: | 55 | 25 | |
| | TOTAL | 110 hrs. | 50 | |

Detail of Syllabus

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| 1. English Literacy Hours of Instruction: 20 Hrs. | | Marks Allotted: 09 |
| Pronunciation | Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech) | |
| Functional Grammar | Transformation of sentences, Voice change, Change of tense, Spellings. | |
| Reading | Reading and understanding simple sentences about self, work and environment | |
| Writing | Construction of simple sentences Writing simple English | |
| Speaking / Spoken English | Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Cardinal (fundamental) numbers ordinal numbers. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication. | |
| 2. I.T. Literacy Hours of Instruction: 20 Hrs. | | Marks Allotted: 09 |
| Basics of Computer | Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer. | |
| Computer Operating System | Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications. | |
| Word processing and Worksheet | Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document. Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets | |
| Computer Networking and INTERNET | Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication. Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes. | |

| 3. Communication Skills Hour of Instruction: 15 Hrs. | | Marks |
|---|---|---------------------------|
| | | Allotted: 07 |
| Topic | Contents | |
| Introduction to Communication Skills | Communication and its importance | |
| | Principles of Effective communication | |
| | Types of communication - verbal, non verbal, written, email, talking on phone. | |
| | Non verbal communication -characteristics, components-Para-language | |
| | Body - language | |
| | Barriers to communication and dealing with barriers. | |
| | Handling nervousness/ discomfort. | |
| | | |
| Listening Skills | Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening. | |
| | Triple- A Listening - Attitude, Attention & Adjustment. | |
| | Active Listening Skills. | |
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| Motivational Training | Characteristics Essential to Achieving Success | |
| | The Power of Positive Attitude | |
| | Self awareness | |
| | Importance of Commitment | |
| | Ethics and Values | |
| | Ways to Motivate Oneself | |
| | Personal Goal setting and Employability Planning. | |
| | | |
| Facing Interviews | Manners, Etiquettes, Dress code for an interview | |
| | Do's & Don'ts for an interview | |
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| Behavioral Skills | Problem Solving | |
| | Confidence Building | |
| | Attitude | |
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| 4. Entrepreneurship Skills | | |
| Hour of Instruction: 15 Hrs. | | Marks Allotted: 06 |

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| Concept of Entrepreneurship | Entrepreneur - Entrepreneurship - Enterprises:- Conceptual issue Entrepreneurship vs. management, Entrepreneurial motivation. Performance & Record, Role & Function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business. |
| Project Preparation & Marketing analysis | Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of PLC, Sales & distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix. |
| Institutions Support | Preparation of Project. Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes& procedure & the available scheme. |
| Investment Procurement | Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes. |
| 5. Productivity Hour of Instruction: 10 Hrs. Marks Allotted: 05 | |
| Benefits | Personal / Workman - Incentive, Production linked Bonus, Improvement in living standard. Industry Nation. |
| Affecting Factors | Skills, Working Aids, Automation, Environment, Motivation How improves or slows down. |
| Comparison with developed countries | Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages. |
| Personal Finance Management | Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance. |
| 6. Occupational Safety, Health and Environment Education Hour of Instruction: 15 Hrs. Marks Allotted: 06 | |
| Safety & Health | Introduction to Occupational Safety and Health importance of safety and health at workplace. |
| Occupational Hazards | Basic Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention. |
| Accident & safety | Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures. |

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| First Aid | Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person |
| Basic Provisions | Idea of basic provision of safety, health, welfare under legislative of India. |
| Ecosystem | Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance. |
| Pollution | Pollution and pollutants including liquid, gaseous, solid and hazardous waste. |
| Energy Conservation | Conservation of Energy, re-use and recycle. |
| Global warming | Global warming, climate change and Ozone layer depletion. |
| Ground Water | Hydrological cycle, ground and surface water, Conservation and Harvesting of water |
| Environment | Right attitude towards environment, Maintenance of in-house environment |
| 7. Labour Welfare Legislation | |
| Hour of Instruction: 05 Hrs. Marks Allotted: 03 | |
| Welfare Acts | Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act. |
| 8. Quality Tools | |
| Hour of Instruction: 10 Hrs. Marks Allotted: 05 | |
| Quality Consciousness | Meaning of quality, Quality characteristic. |
| Quality Circles | Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles. |
| Quality Management System | Idea of ISO 9000 and BIS systems and its importance in maintaining qualities. |
| House Keeping | Purpose of Housekeeping, Practice of good Housekeeping. |
| Quality Tools | Basic quality tools with a few examples |

Tools & Equipment for Employability Skills:

| Sl. No. | Name of the Equipment | Quantity |
|----------------|--|-----------------|
| 1 | Computer (PC) with latest configurations and Internet connection with standard operating system and standard word processor and worksheet software | 10 nos. |
| 2 | UPS - 500Va | 10 nos. |
| 3 | Scanner cum Printer | 1 no. |
| 4 | Computer Tables | 10 nos. |
| 5 | Computer Chairs | 20 nos. |
| 6 | LCD Projector | 1 no. |
| 7 | White Board 1200mm x 900mm | 1 no. |

* Note: Above Tools & Equipments not required, if Computer LAB is available in the institute.

Syllabus for

ENGINEERING DRAWING

GENERAL INFORMATION
(Engineering Drawing)

1. **Name of the Subject** : ENGINEERING DRAWING
2. **Hours of Instruction** : **150 hrs.**
3. **Instructor Qualification** : Degree in Engineering with one year experience
OR
Diploma in Engineering with two years experience
OR
NCVT / NAC in the Draughtsman (Mechanical / Civil) with three years experience.
4. **Desirable** : Craft Instructor Certificate in RoD & A course under NCVT.
5. **Instructor:**
 - One full time instructor is required for 144Engineering seats sanctioned in the institute. Additional instructor will be required on increase in every 144 students.
 - For seats less than 144, the instructor may be out sourced/ hired on contract basis.

Details of syllabus

| Sl. No. | Topics (Total duration – 150 hrs.) |
|---------|---|
| 1. | Introduction to Engineering Drawing and Drawing Instruments : <ul style="list-style-type: none"> - Conventions - Viewing of engineering drawing sheets. - Method of Folding of printed Drawing Sheet as per BIS SP:46-2003 - Drawing board, T-Square, Drafter (Drafting M/c), Set Squares, Protractor, Drawing Instrument Box (Compass, Dividers, Scale, Diagonal Scales etc.), Pencils of different Grades, Drawing pins / Clips. |
| 2. | Lines : <ul style="list-style-type: none"> - Definition, types and applications in Drawing as per BIS SP:46-2003 - Classification of lines (Hidden, centre, construction, Extension, Dimension, Section) - Drawing lines of given length (Straight, curved) - Drawing of parallel lines, perpendicular line - Methods of Division of line segment |
| 3. | Free hand drawing of <ul style="list-style-type: none"> - Lines, polygons, ellipse, etc. - geometrical figures and blocks with dimension Transferring measurement from the given object to the free hand sketches. |
| 4. | Lettering and Numbering as per BIS SP46-2003: <ul style="list-style-type: none"> - Single Stroke, Double Stroke, inclined, |
| 5. | Drawing of Geometrical Figures: Definition, nomenclature and practice of <ul style="list-style-type: none"> - Angle: Measurement and its types, method of bisecting. - Triangle -different types - Rectangle, Square, Rhombus, Parallelogram. - Circle and its elements. |
| 6. | Sizes and Layout of Drawing Sheets <ul style="list-style-type: none"> - Selection of sizes - Title Block, its position and content - Item Reference on Drawing Sheet (Item List) |
| 7. | Method of presentation of Engineering Drawing <ul style="list-style-type: none"> - Pictorial View - Orthographic View - Isometric view |
| 8. | Symbolic Representation used in the related trade (as per BIS SP:46-2003) of : <ul style="list-style-type: none"> - Fastener (Rivets, Bolts and Nuts) - Bars and profile sections - Weld, brazed and soldered joints. - Electrical and electronics element - Piping joints and fittings |
| 9. | Dimensioning practice: <ul style="list-style-type: none"> - Position of dimensioning (unidirectional, aligned, as per BIS SP:46-2003) - Types of arrowhead |

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| | <ul style="list-style-type: none"> - Leader Line with text - Symbols preceding the value of dimension and dimensional tolerance. |
| 10. | - Drawing of Solid figures (Cube, Cuboids, Cone) with dimensions. |
| 11. | Free hand Drawing of Solid figures (Prism, Pyramid, Frustum of Cone and Pyramid.) with dimensions. |
| 12. | Free Hand sketch of hand tools and measuring tools used in respective trades. |
| 13. | Projections: <ul style="list-style-type: none"> - Concept of axes plane and quadrant. - Orthographic projections - Method of first angle and third angle projections (definition and difference) - Symbol of 1st angle and 3rd angle projection as per IS specification. |
| 14. | Drawing of Orthographic projection in 3 rd angle. |
| 15. | Free hand Drawing of simple fastener (Rivet, Bolts, Nuts & Screw) |
| 16. | Free hand sketching of simple objects related to trade. |
| 17. | Reading of fabricated engineering drawing |

LIST OF TOOLS & EQUIPMENTS

| Sl. No. | NAME OF TOOLS / EQUIPMENTS | QUANTITY |
|----------------|-----------------------------------|-----------------|
| 1. | Drawing Board | 20 |
| 2. | Models : Solid & cut section | As required |
| 3. | Table for trainees | 20 |
| 4. | Stool for trainees | 20 |
| 5. | Cupboard (big) | 01 |
| 6. | White Board (size: 8ft. x 4ft.) | 01 |
| 7. | Trainer's Table | 01 |
| 8. | Trainer's Chair | 01 |

Syllabus for

Workshop Calculation & Science

GENERAL INFORMATION
(Workshop Calculation & Science)

1. **Name of the subject** : WORKSHOP CALCULATION & SCIENCE
2. **Hours of Instruction** : 110 hrs.
3. **Examination** : The examination for the subject will be held at the end of training.
4. **Instructor Qualification** : Degree in Engineering with one year experience
OR
Diploma in Engineering with two years experience
5. **Desirable** : Craft Instructor Certificate in RoD& A course under NCVT.
6. **Instructor:**

One full time instructor is required for 144Engineering seats sanctioned in the institute. Additional instructor will be required on increase in every 144 students.

For seats less than 144, the instructor may be out sourced/ hired on contract basis.

SYLLABUS FOR WORKSHOP CALCULATION AND SCIENCE

(Total duration -110 hrs.)

| Topic No | Workshop Calculation | Workshop Science |
|----------|--|--|
| 1. | <p>Unit: Systems of unit- FPS, CGS, MKS/SI unit, Unit of length, Mass and time. Conversion of units.</p> | <p>Material Science : Definition, properties (physical & mechanical) and uses of Metal, Non-metal, Alloy & Insulator. Types of ferrous and Non-ferrous metals. Difference between Ferrous and Non-Ferrous metals.</p> |
| 2. | <p>Basic Mathematics - BODMAS rule Fraction-Addition, Subtraction, multiplication and Division-Problem solving, Decimal-Addition. Simple calculation using Scientific Calculator.</p> | <p>Mass, Weight and Density: Mass, Unit of Mass, Weight, difference between mass and weight. Density, unit of density. Relation between mass, weight & density. Simple problems related to mass, weight, and density.</p> |
| 3. | Conversion of Fraction to Decimal and vice-versa. | |
| 4. | Ratio & Proportion: Simple calculations & related problems solving. | |
| 5. | <p>Percentage: Introduction, Simple calculation. Changing percentage to fraction and decimal & vice-versa.</p> | |
| 6. | <p>Basic Algebra: Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).</p> | <p>Elasticity: Elastic & Plastic material. Stress & strain and their units. Young's modulus. Ultimate stress and breaking stress.</p> |
| 7. | <p>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 and Sphere.</p> | <p>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.</p> |

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| 8. | | Basic Electricity: Introduction and use of Electricity. AC, DC & their comparisons. Current, Voltage, Resistance & their units. Power, Energy & their units. Insulator and conductors & their uses. |
|----|--|---|

BLOCK – II

DURATION: 05 Months (22 Weeks)

Industry level training

DETAILS OF PRACTICAL SKILLS TO BE COVERED DURING INDUSTRY TRAINING –MECHANIC AUTO BODY PAINTING

Duration of training: - 05 Months

Actual training will depend on the existing facilities available in the establishments.

The candidate should be competent to execute following operation/ skills after completion of the industrial training: -

1. Identify Non Paint and Paint Tools and Equipment
2. Perform Base Preparation Operation:
 - Prepare a Panel using Right Feather Edging Technique.
 - Prepare a Damage Surface while reducing damage size.
3. Perform Pre Paint Preparation Process:
 - Perform Body filler Sanding Technique.
 - Dry sanding (Dust Free Sanding)
 - Panel Preparation through body filler application using different type of sanding papers with primer surface application.
4. Perform painting on vehicle and vehicle body parts.
5. Perform Post paint Preparation.
 - Paint Inspection using compound with wool and foam pad.
 - Denibbing of dust from panel with Angular Orbital Sander and compound
6. Perform Optimized Surface Preparation.
7. Perform Preventive maintenance of Tools and Equipment used.

Theory to be covered during Industrial Training

- 1) Explain in details about Non Paint and Paint Tools and Equipment.
- 2) Describe Process of Base Preparation Operation.
- 3) Explain Pre Paint Preparation Process.
- 4) Describe step by step process of painting on vehicle and vehicle body parts.
- 5) Describe Post paint Preparation and process involved.
- 6) Explain Theory of Optimized Surface Preparation.

NOTE: -

1. In addition to the above mentioned skills/ operations industry may impart training on any other skills/ operations related to the trade.
2. Assignment should be planned so that the trainees may spend 20% of the total time of production/service type of work (using gauges, templates, fixture etc.) for developing their skill and confidence about manufacturing which will help ever in self- employment, if found necessary in the future.

BLOCK – III

DURATION: 2 Months (08 Weeks)

Institute level training

For last two months candidates will be engaged in following works: -

1. Revision of theoretical components covered during Block – I.
2. Practical practice and project report submission.
3. Preparing candidate to face interview, preparation of bio-data, awareness about different jobs in the related field and grooming to be an entrepreneur.
4. Self study and final AITT examination.

Note:-

1. The training may be conducted in Block mode i.e. few months in ITI & few in Industry.
2. The training may be conducted in flexible mode i.e. few days of a week in ITI& few days in Industry.
3. Five months industrial training is mandatory.
4. Last two months of training in ITI is mandatory.
5. No admission of trainees without signing MOU with industry by the Institute (ITI).
6. To sign MOU with ITI, industry must ensure that, training facility is available to impart all skill sets as indicated in Block-II. Industry should make arrangements to provide all the Skill set as in Block-II for the trade in the Industry either by itself or through its ancillary units or in association with some other Industries.
7. If the industry ensures delivery of skill training as per Sl. 6 then 2nd MOU is not necessary.
8. However, Industry should ensure 100% skill training indicated in Block-II & necessary arrangement to be made to cover training on rest skill set (beyond the % indicated in sl.6) in collaboration with any other related industries. Extensive use of E-learning process may also be adopted.

TRADE: MECHANIC AUTO BODY PAINTING (Dual Mode)

LIST OF TOOLS & EQUIPMNT

A. TRAINEES TOOL KIT per 4 Trainees FOR 16 TRAINEES +1 ISTRUCTOR

| Sl.No. | Item with specification | Qty (Nos.) |
|---------------|--|-------------------|
| 1. | Allen Key set of 12 pieces (2mm to 14mm) | (4+1) |
| 2. | Bucket, sponge, squeegee, chamois & tack rags | 5 |
| 3. | Caliper inside 15 cm Spring | 5 |
| 4. | Calipers outside 15 cm spring | 5 |
| 5. | Center Punch 10 mm. Dia. x 100 mm. | 5 |
| 6. | Different type of spoon | 5 |
| 7. | Dividers 15 cm Spring | 5 |
| 8. | Electrician Screw Driver 250mm | 5 |
| 9. | General purpose dolly | 5 |
| 10. | Hammer ball peen 0.5 kg with handle | 5 |
| 11. | Hands file 20 cm. Second cut flat | 5 |
| 12. | Paint scrapper, putty mixing board, putty applicator /knife | 5 |
| 13. | Pliers combination 20 cm. | 5 |
| 14. | Safety glasses | 5 |
| 15. | Screw driver 20cm.X 9mm. Blade | 5 |
| 16. | Screw driver 30 cm. X 9 mm. Blade | 5 |
| 17. | Scriber 15 cm | 5 |
| 18. | Spanner D.E. set of 12 pieces (6mm to 32mm) | 5 |
| 19. | Spanner, ring set of 12 metric sizes 6 to 32 mm. | 5 |
| 20. | Spanners socket with speed handle, T-bar, ratchet and universal upto 32 mm set of 28 pieces with box | 5 |
| 21. | Steel rule 30 cm inch and metric | 5 |

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| 22. | Steel tool box with lock and key (folding type) 400x200x150 mm | 5 |
| 23. | Toe dolly | 5 |
| 24. | Wire cutter and stripper | 5 |

B. Tools Instruments and General Shop outfits

| Sl.No. | Item with specification | Qty. (Nos) |
|---------------|--|-------------------|
| 1. | Adjustable spanner (pipe wrench 350 mm) | 2 |
| 2. | Air blow gun with standard accessories | 1 |
| 3. | Air impact wrench with standard accessories | 4 |
| 4. | Air ratchet with standard accessories | 4 |
| 5. | Allen Key set of 12 pieces (2mm to 14mm) | 2 |
| 6. | Ammeter 300A/ 60A DC with external shunt | 5 |
| 7. | Angle plate adjustable 250x150x175 | 1 |
| 8. | Angle plate size 200x100x200mm | 2 |
| 9. | Anvil 50 Kgs with Stand | 1 |
| 10. | Battery -charger | 2 |
| 11. | Blow Lamp 1 litre | 2 |
| 12. | Bucket, sponge, squeegee, chamois & tack rags | 2 each |
| 13. | Caliper inside 15 cm Spring | 4 |
| 14. | Calipers outside 15 cm spring | 2 |
| 15. | Car Jet washer with standard accessories | 1 |
| 16. | Chain Pulley Block-3 ton capacity with tripod stand | 1 |
| 17. | Chisel 10 cm flat | 4 |
| 18. | Chisels cross cut 200 mm X 6mm | 4 |
| 19. | Circlip pliers Expanding and contracting type 15cm and 20cm each | 2 |
| 20. | Clamps C 100mm | 2 |
| 21. | Clamps C 150mm | 2 |
| 22. | Clamps C 200mm | 2 |
| 23. | Cleaning tray 45x30 cm. | 4 |
| 24. | Collapsible panel stands | 2 |
| 25. | Colour matching cards /panels (Magnetic, chromalux card or primed metal) | 10 |
| 26. | Copper bit soldering iron 0.25 Kg | 5 |
| 27. | Cylinder bore gauge capacity 20 to 160 mm | 2 |
| 28. | DC Ohmmeter 0 to 300 Ohms, mid scales at 20 Ohms | 2 |
| 29. | Depth micrometer 0-25mm | 4 |
| 30. | Dial gauge type 1 Gr. A (complete with clamping devices and stand) | 4 |
| 31. | Different type of Bumping hammers | 1 set |
| 32. | Different type of -body hammers | 1 set |
| 33. | Different type of body picks | 1 set |
| 34. | Different type of body spoon | 1 set |

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| 35. | Different type of dolly block | 1 set |
| 36. | Different type of finishing hammers | 1 set |
| 37. | Different type of pick hammers | 1 set |
| 38. | Digital thermometer | 2 |
| 39. | Dividers 15 cm Spring | 4 |
| 40. | Door handle tool (clip pullers) | 1 |
| 41. | Drift Punch Copper 15 Cm | 4 |
| 42. | Drill point angle gauge | 1 |
| 43. | Drill twist 1.5 mm to 15 mm (various sizes) by 0.5 mm | 4 |
| 44. | Electric Soldering Iron 230 V 60 watts 230 V 25 watts | 2 each |
| 45. | Electric testing screw driver | 2 |
| 46. | Engineer's square 15 cm. Blade | 2 |
| 47. | Feeler gauge 20 blades (metric) | 2 |
| 48. | File flat 20 cm bastard | 4 |
| 49. | File, half round 20 cm second cut | 4 |
| 50. | File, Square 20 cm second cut | 4 |
| 51. | File, Square 30 cm round | 4 |
| 52. | File, triangular 15 cm second cut | 4 |
| 53. | Files assorted sizes and types including safe edge file (20 Nos) | 2 set |
| 54. | Flat File 25 cm second cut | 4 |
| 55. | Flat File 35 cm bastard | 4 |
| 56. | Garage rack | 2 |
| 57. | Gloves for Welding (Leather and Asbestos) | 5 sets |
| 58. | Granite surface plate 1600 x 1000 with stand and cover | 1 |
| 59. | Grease Gun | 2 |
| 60. | Grip Wrench 200mm | 2 |
| 61. | Growler | 1 |
| 62. | Hacksaw frame adjustable 20-30 cm | 10 |
| 63. | Hammer Ball Peen 0.75 Kg | 4 |
| 64. | Hammer Chipping 0.25 Kg | 5 |
| 65. | Hammer copper 1 Kg with handle | 4 |
| 66. | Hammer Mallet | 4 |
| 67. | Hammer Plastic | 4 |
| 68. | Hand operated crimping tool (i) for crimping up to 4mm and (ii) for crimping up to 10mm | 2 |
| 69. | Hand reamers adjustable 10.5 to 11.25 mm, 11.25 to 12.75 mm, 12.75 to 14.25 mm and 14.25 to 15.75 mm | 2sets |
| 70. | Hand Shear Universal 250mm | 2 |
| 71. | Hand vice - 37 mm | 2 |
| 72. | Hollow Punch set of seven pieces 6mm to 15mm | 2 sets each |
| 73. | Insulated Screw driver 20 cm x 9mm blade | 2 |
| 74. | Insulated Screw driver 30 cm x 9mm blade | 2 |
| 75. | Interchangeable driver set | 1 set |
| 76. | Lead light | 2 |
| 77. | Left cut snips 250mm | 4 |
| 78. | Lifting jack screw type 3 ton capacity | 4 |

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| 79. | Magneto spanner set with 8 spanners | 1 set |
| 80. | Magnifying glass 75mm | 2 |
| 81. | Marking out table 90X60X90 cm. | 1 |
| 82. | Multimeter digital | 5 |
| 83. | Oil can 0.5/0.25 liter capacity | 2 |
| 84. | Oil Stone 15 cm x 5 cm x 2.5 cm | 1 |
| 85. | Outside micrometer 0 to 25 mm | 4 |
| 86. | Outside micrometer 25 to 50 mm | 4 |
| 87. | Outside micrometer 50 to 75 mm | 1 |
| 88. | Outside micrometer 75 to 100 mm | 1 |
| 89. | Paint measuring / mixing stick & jug sets | 4 each |
| 90. | Paint scrapper, putty mixing board, putty applicator /knife | 2 each |
| 91. | Panel buffing machine (18 cm) | 2 |
| 92. | Philips Screw Driver set of 5 pieces (100 mm to 300 mm) | 2 sets |
| 93. | Pipe cutting tool | 2 |
| 94. | Pipe flaring tool | 2 |
| 95. | plastic feeler gauges | 2 |
| 96. | Pliers combination 20 cm. | 2 |
| 97. | Pliers flat nose 15 cm | 2 |
| 98. | Pliers round nose 15 cm | 2 |
| 99. | Pliers side cutting 15 cm | 2 |
| 100. | Portable electric drill Machine | 1 |
| 101. | Prick Punch 15 cm | 4 |
| 102. | Punch Letter 4mm (Number) | 2 set |
| 103. | Right cut snips 250mm | 4 |
| 104. | Rivet sets snap and Dolly combined 3mm, 4mm, 6mm | 4 |
| 105. | Scraper flat 25 cm | 4 |
| 106. | Scraper half round 25 cm | 4 |
| 107. | Scraper Triangular 25 cm | 2 |
| 108. | Scriber 15 cm | 4 |
| 109. | Scriber with scribing black universal | 2 |
| 110. | Set of stock and dies - Metric | 2 sets |
| 111. | Shear Tin Man's 450 mm x 600mm | 4 |
| 112. | Sheet metal cutting pliers-left , right hand and straight - jaw Configuration | 1 set |
| 113. | Sheet Metal Gauge | 2 |
| 114. | Sher Tinmans 300mm | 4 |
| 115. | Soldering Copper Hatchet type 500gms | 5 |
| 116. | Solid Parallels in pairs (Different size) in Metric | 2 |
| 117. | Spanner Clyburn 15 cm | 1 |
| 118. | Spanner D.E. set of 12 pieces (6mm to 32mm) | 4 |
| 119. | Spanner T. flocks for screwing up and up-screwing inaccessible | 2 |
| 120. | Spanner, adjustable 15cm. | 2 |
| 121. | Spanner, ring set of 12 metric sizes 6 to 32 mm. | 2 |
| 122. | Spanners socket with speed handle, T-bar, ratchet and universal | 2 |

| | | |
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| | upto | |
| 123. | Spark lighter | 2 |
| 124. | Spark plug spanner 14mm x 18mm x Size | 2 |
| 125. | Spirit level 2 V 250, 05 metre | 2 |
| 126. | spring scale | 2 |
| 127. | Steel measuring tape 10 meter in a case | 2 |
| 128. | Steel rule 15 cm inch and metric | 4 |
| 129. | Steel rule 30 cm inch and metric | 4 |
| 130. | Steel wire Brush 50mmx150mm | 4 |
| 131. | Straight edge gauge 2 ft. | 1 |
| 132. | Stud extractor set of 3 | 2 sets |
| 133. | Stud remover with socket handle | 1 |
| 134. | Suction cup | 2 |
| 135. | Surface gauge with dial test indicator plunger type i.e. 0.01 mm | 2 |
| 136. | Taps and Dies complete sets (5 types) | 1 set |
| 137. | Taps and wrenches - Metric | 2 sets |
| 138. | Telescope gauge | 4 |
| 139. | Thread pitch gauge metric, BSW | 1 |
| 140. | Torque wrenches 5-35 Nm, 12-68 Nm & 50-225 Nm | 1 each |
| 141. | Trammel 30 cm | 2 |
| 142. | Trim and upholstery tools | 1 set |
| 143. | Tyre pressure gauge with holding nipple | 2 |
| 144. | Universal puller for removing pulleys, bearings | 1 |
| 145. | V' Block 75 x 38 mm pair with Clamps | 2 |
| 146. | Vacuum gauge to read 0 to 760 mm of Hg. | 2 |
| 147. | Various sanding blocks-soft, hard, speed file & de-nibbling tools | 2 set |
| 148. | vernier caliper 0-300 mm with least count 0.02mm | 4 |
| 149. | Vice grip pliers | 2 |
| 150. | Voltmeter 50V/DC | 5 |
| 151. | Wire Gauge (metric) | 5 |
| 152. | Work bench 250 x 120 x 60 cm with 4 vices 12cm Jaw | 1 |

C. General Installation/ Machineries

| Sl. No. | Item with specification | Qty (Nos.) |
|---------|--|------------|
| 1. | Angle grinder (10-12 cm) - for cutting and grinding | 2 |
| 2. | Arbor press hand operated 2 ton capacity | 1 |
| 3. | Belt sander (Narrow surface) | 2 |
| 4. | Bench lever shears 250mm Blade x 3mm Capacity | 1 |
| 5. | Body shell for painting - Light Motor vehicle of different Manufactures | 4 |
| 6. | compressed air line -10m (on retractable reel, with high flow connectors) with FRL unit | 2 |
| 7. | Computerized colour retrieval unit (Spectrophotometer) | 1 |
| 8. | Die Grinding kit | 2 |
| 9. | Disc sander - 18 cm | 2 |
| 10. | Discrete Component Trainer / Basic Electronics Trainer | 1 |
| 11. | Down draft spray booth (7.5 X 5 m, combi spray/oven or separate spray /oven | 1 |
| 12. | Drilling machine bench to drill up to 12mm dia along with accessories | 1 |
| 13. | Dual Magnetization Yoke : AC / HWDC. 230 VAC. 50Hz | 1 set |
| 14. | Dust extraction connections (Vacumm) | 2 |
| 15. | Electronic paint mixing scales (accurate to 0.1 grams. explosion proof & | 1 |
| 16. | Grinding machine (general purpose) D.E. pedestal with 300 mm dia wheels rough and smooth | 1 |
| 17. | High pressure hot / cold water blasting unit | 1 |
| 18. | Hydraulic jack HI-LIFT type -3 ton capacity. & % ton capacity | 1 each |
| 19. | Infrared drying lamp unit | 1 |
| 20. | Liquid penetrant Inspection kit | 1 set |
| 21. | Motor Vehicle suitable for Body painting -Light Motor vehicle of different | 2 |
| 22. | Paint surface film thickness gauge (electronic) | 2 |
| 23. | Paint tinting system mixing machine (exposition proof) | 1 |
| 24. | Parts spray booth cabin (ventilated to 30 cubic m / minute) | 1 |
| 25. | Pipe Bending Machine (Hydraulic type) 12mm to 30mm | 1 |
| 26. | Pneumatic rivet gun | 2 |
| 27. | Random /dual action orbital sander (12-15 cm) | 2 |
| 28. | Spray gun & mixing equipment cleaning machine(explosion proof) & bench | 2 each |
| 39. | Spray guns (gravity feed primer. COB/2K colour& clear coat. touch-up set) | 4 |
| 29. | Tin smiths bench folder 600 x 1.6mm | 1 |
| 30. | Trolley type portable air compressor single cylinder with 45 liters capacity Air tank. along with accessories & with working pressure 6.5 kg/sq cm | 1 |
| 31. | Underbody sealer & corrosion proofing materials & spray units | 2 each |
| 32. | Ventilated preparation bays (fully illuminated. down or end draught | 1 |
| 33. | Water &oi l separati on system | 1 37 |
| 34. | Weld through primer application equipment | 2 |

D. List of consumable:

| Sl. No. | Description | Quantity |
|----------------|---|-----------------|
| 1. | Battery- SMF | As required |
| 2. | Brake fluids | As required |
| 3. | Chalk. Prussian blue. | As required |
| 4. | Chemical compound for fasteners | As required |
| 5. | Diesel | As required |
| 6. | Different type gasket material | As required |
| 7. | Different type of oil seal | As required |
| 8. | Drill Twist (assorted) | As required |
| 9. | Engine Oil | As required |
| 10. | Engine Coolant | As required |
| 11. | Emery paper - 36-60 grit . 80-120 | As required |
| 12. | Gear oils | As required |
| 13. | Hacksaw blade (consumable) | As required |
| 14. | Hand rubber gloves tested for 5000 V | As required |
| 15. | Holder. lamp teakwood boards. plug sockets. | As required |
| 16. | Hydrometer | As required |
| 17. | Lapping abrasives | As required |
| 18. | Leather Apron | As required |
| 19. | Petrol | As required |
| 20. | Power steering oil | As required |
| 21. | Radiator Coolants | As required |
| 22. | Safety glasses | As required |
| 23. | Steel wire Brush 50mmx150mm | As required |
| 24. | Gloves for Welding (Leather and Asbestos) | As required |
| 25. | Cotton waste/ cloth | As required |
| 26. | Body filler (Consumable) | As required |
| 27. | Body filler (Consumable) | As required |
| 28. | Masking paper / plastic & back-masking tape | As required |
| 29. | Refinishing material (consumable) | As required |

E. Workshop Furniture

| Sl. No. | Description | Quantity |
|----------------|--|-----------------|
| 1. | Book shelf (glass panel) 6'x 3'x 1' | As required |
| 2. | Computer Chair | 1+1 |
| 3. | Computer Table | 1+1 |
| 4. | Desktop computer and related MS office software | 1+1 |
| 5. | Discussion Table 8' x 4' x 2 ¹ / ₂ ' | 2 |
| 6. | Fire Extinguishers. first- aid box | As required |
| 7. | Instructional Material - NIMI Books/Ref. books | As required |
| 8. | Internet connection with all accessories | As required |
| 9. | Laser printer | 1 |

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| 10. | LCD projector/ LED /LCD TV (42") | 1 |
| 11. | Multimedia DVD for Automotive application/subjects | As required |
| 12. | Stools | 21 |
| 13. | Storage Rack 6' x 3' x 1' | As required |
| 14. | Storage shelf 6' x 3' x 1' | As required. |
| 15. | Suitable class room furniture | As required |
| 16. | Suitable Work Tables with vices | As required |
| 17. | Tool Cabinet - 6' x 3' x 1' | 2 |
| 18. | Trainees locker | 2 Nos. to accommodate 20 Lockers |

Format for Internal Assessment

| Name & Address of the Assessor : | | | | | | Year of Enrollment : | | | | | | | | |
|--------------------------------------|---------------------------------|------------------------|----------------------|-------------------|------------------------|---|--------------------------|------------------------------------|-----------------------------|---------------------|------------------------|------|---------------------------------|--------------|
| Name & Address of ITI (Govt./Pvt.) : | | | | | | Date of Assessment : | | | | | | | | |
| Name & Address of the Industry : | | | | | | Assessment location: Industry / ITI | | | | | | | | |
| Trade Name : | | | Block: | | | Duration of the Trade/course: | | | | | | | | |
| Operation/Skill: | | | | | | | | | | | | | | |
| Sl.No | Maximum Marks (Total 100 Marks) | | 15 | 5 | 10 | 5 | 10 | 10 | 5 | 10 | 15 | 15 | Total internal assessment Marks | Result (Y/N) |
| | Candidate Name | Father's/Mother's Name | Safety consciousness | Workplace hygiene | Attendance/Punctuality | Ability to follow Manuals/ Written instructions | Application of Knowledge | Skills to handle tools & equipment | Economical use of materials | Speed in doing work | Quality in workmanship | VIVA | | |
| 1 | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | |

LIST OF TRADE COMMITTEE MEMBERS

| Sl. No. | Name & Designation | Organization | Remarks |
|----------------|--|---|----------------|
| 1. | R. K. Pathak, Director (T) | DGT, MSDE, New Delhi | Chairman |
| 2. | L. K. Mukherjee, DDT | CSTARI, Kolkata | Member |
| 3. | R. N. Manna, Training Officer | CSTARI, Kolkata | Member |
| 4. | Amar G. Prabhu, Principal | Don Bosco ITI, Kurla | Member |
| 5. | Saurabh Shringi, Efficiency Manager | MIRKA, Mumbai | Member |
| 6. | Akhilesh Pandey, Training Officer | ATI Mumbai | Member |
| 7. | Ashfaq Mujawar, Bodyshop Manager | Madhuban Toyota Mumbai | Member |
| 8. | Rabindra Saty, Bodyshop Manager | Bhavna Ford, Mumbai | Member |
| 9. | B. Sridhar, Manager O. D. | Mahindra & Mahindra Ltd. Mumbai | Member |
| 10. | D. K. Sharma, MD | Technology Exchange Services Pvt. Ltd., Ahmedabad | Member |
| 11. | Mr. Raj Kava, Proprietor | Kava Automobiles | Member |
| 12. | Mr. M. K. Deshmukh, Partner | R. S. Automobiles, Mumbai | Member |
| 13. | Mr. Alok Dhanuka, G. M. (Service) | Dhhruvil Automobile LLP, Ahmedabad | Member |
| 14. | Mr. Umesh Panchal, Service Manager | Popular Wheelers (India) Pvt. Ltd. | Member |