

**CURRICULUM**

**FOR THE TRADE OF**

**Mechanic Auto Body Repair**

**UNDER**

**DUAL TRAINING SCHEME**

**2017**

**BY**



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

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

<b>BLOCK WITH DURATION</b>	<b>THEORY</b>	<b>PRAC.</b>	<b>WSC/ CAL</b>	<b>ENGG. DRG.</b>	<b>EMP.SK ILL</b>	<b>ECA, LIB. &amp; OTHERS</b>	<b>REM.</b>
BLOCK – I (05months/2 2 Weeks duration ) Institute level trg.	230hrs.	300 hrs.	80 hrs.	120 hrs.	100hrs.	10 hrs.	40 hrs. Revision & Test
BLOCK – II (05months / 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.
<b>GRAND TOTAL</b>	<b>320hrs.</b>	<b>1294hrs.</b>	<b>110 hrs.</b>	<b>150 hrs.</b>	<b>110 hrs.</b>	<b>16hrs.</b>	<b>80 hrs.</b>
<b>Total duration of training inclusive of Industry &amp; Institute is 1 years (2080 hrs.)</b>							

## GENERAL INFORMATION

- 1. Name of the Trade** : **Mechanic Auto Body Repair (Dual Mode)**
- 2. N.C.O. Code No.** : 7213.0301, 7212.0100, 7212.0400
- 3. Duration of Craftsmen Training** : 12 months (Three Blocks).
- 4. Power norms** : 4 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 Repair”** 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 REPAIR” TRADE**

Block – I

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

**Institute Level Training: -**

Sl. No.	Practical Duration: - 300 hrs.	Theory Duration: - 230 hrs.
1.	<p><b>Induction training:</b></p> <ul style="list-style-type: none"> <li>- Familiarisation with the Institute.</li> <li>- Importance of trade Training</li> <li>- Machinery used in the trade.</li> </ul> <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.</p> <p>Demonstration on safe handling and Periodic testing of lifting equipment, and Safety disposal of Used engine oil. Energy saving Tips/Audit of ITI electricity Usage</p>	<p><b>General</b></p> <p>Occupational Safety &amp; Health Importance of Safety and general Precautions to be observed in the shop. Basic first aid, safety signs - for Danger, Warning, caution &amp; 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 &amp; road testing vehicles,</p> <p>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 to measure a wheel base of a vehicle with measuring tape.</p> <p>Practice to remove wheel lug nuts with use of an air impact wrench</p> <p>Practice on General workshop tools &amp; 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,</p> <p>Screw drivers-blade screwdriver, Phillips screw driver, Ratchet screwdriver. Allen key, bench vice &amp; C-clamps, Spanners- ring</p>

		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 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	Drilling machine -Description and study of

	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. Adjustment of two piece Die. Reaming a hole/ Bush to suit the given pin/ shaft, scraping a given machined surface.	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. 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.	Service FRL Unit	Introduction to Hydraulics & Pneumatics: 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, Jacks, Stands.	Auto Industry - History, leading manufacturers, development in automobile industry, trends, new product. 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. 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. Brief description and uses of Vehicle hoists - Two post and four post hoist, Engine hoists, Jacks, Stands.
11.	Practice on preparation of accident report. Preparation of Body shop repair sequence procedures. Washing of vehicle. Identification of different type body, chassis, Drive lines. Identify the location of parts and panels.	Introduction to Engine: Description of internal & external combustion engines, Classification of IC engines, Principle & working of 2&4-stroke diesel engine (Compression ignition Engine (C.I)), Principle of Spark Ignition Engine(SI), differentiate between 2-stroke and 4 stroke, C.I engine and S.I Engine, Direct injection and Indirect

	<p>Identify the parts of unibody design vehicle.</p> <p>Identify the front body structural components of a transverse-mounted engine of FWD vehicle. Identify the rear body structural components of a unibody sedan. Identify the under body front and rear section structural components of a unibody sedan.</p> <p>Identify the front, rear body structural components of mid-engine vehicle.</p> <p>Identify the parts of a full frame of pickup truck and Sports utility vehicle (SUV)</p>	<p>injection, Technical terms used in engine, Engine specification..</p> <p>Vehicle construction Technology</p> <p>Definition of collision repair, body shop, classification of body shop-Independent body shop, dealership body shop, specialty body shop. Description of Repair order(RO)</p> <p>Description of vehicle Body and Chassis, Vehicle Frame- definition, Body- over- frame (Independent frame) construction, Hydro formed frame, Unibody construction; Major Body Sections-Front, Center, rear section, and vehicle left and right sides; Drive line configuration-Transverse engine, longitudinal engine, front-engine front wheel drive (FWD), front-engine rear wheel drive (RWD), Rear-engine rear wheel drive (RRD), Mid-engine rear wheel drive (MRD), Four-wheel drive (4WD); Body Classifications- Based on Car size, Roof designs; Body panels, Description of Unibody Panels and their parts, Unibody Design Factors, Advantage of Aerodynamic design, General unibody characteristics, Plastic parts and panels, composite unibody frame, Aluminium vehicle construction, Body-Over-Frame Considerations -characteristics of body-over-frame vehicles, Full frame designs- Ladder frame, Perimeter frame, X-frame (or backbone frame), Crash Testing-Types of crash tests.</p>
12.	Identify different paint codes, service symbols.	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, Collision Repair Measurements
13.	MIG welding Basics, Usage and Maintenance. Oxy Acetylene welding Basics, Usage and Maintenance.	Welding: Introduction to joining of metals, Welding characteristics, weld terminology, weld symbols, Common Auto body welding techniques- MIG, TIG, Soft brazing, Factory weld specification, Typical Auto body MIG wire sizes, Typical Auto body shielding gases, Heat affected Zone (HAZ), Auto body MIG welding -Principles & characteristics, MIG welding equipments, Welding lens, MIG operation methods, MIG welding equipment, MIG welding current, MIG Arc voltage, MIG Tip to base metal distance, MIG gun angle and welding direction, MIG shield gas flow volume, MIG welding speed, MIG wire speed,

		<p>MIG gun nozzle adjustment, Heat buildup penetration, clamping tools for welding, Welding position. welding Technique- Tack weld, Continuous weld, plug weld, spot weld, lap weld, stitch weld, intermittent weld, Base welding method-Butt welds lap &amp; flange welding, plug weld, stitch weld, MIG welding of Galvanized metals &amp; Aluminum, Welding Aluminum, MIG weld defects, Testing the MIG weld. FCAW (Flux cored Arc welding) , TIG Welding, Resistance spot welding, Resistance spot welding components, Spot welder adjustments, Operating a squeeze-type resistance spot welder, Other spot welding functions, stud spot welds for dent removal, Oxyacetylene welding, welding &amp; cutting equipment, types of flame and adjustment, welding torch flame adjustment, gas cutting torch flame adjustment, cutting HSS for salvage purposes, Heat crayons, Cleaning with a torch, Probable causes and remedies for flame abnormalities, plasma arc cutting, operating a plasma arc cutter. Advantage and disadvantage over different type of welding methods.</p>
<p><b>14.</b></p>	<p>Practice on Basic Single Panel Repair using Dolly hammer</p>	<p>Sheet metal repair. Automotive sheet metal, basic steps for correcting minor sheet metal damage, Low carbon steel, high strength steels (HSS)- Type of HSS- High tensile strength steel (HTSS), Type of loading- Tensile, compress, shear, cleavage, peel, Properties of sheet metal- Yield strength, Compressive strength, shear strength, torsional strength, effect of impact forces (Yield point), elastic deformation, plastic deformation, work hardening, Classifying body damage- direct damage, indirect damage, work hardening, analyzing sheet metal damage, Buckels-simple hinge buckles, pressure forces, single crown panels-door dings, Determining the direction of damage - metal straightening technique- using body hammer, Bumping dent with dollies, Hammer-on-dolly method, Hammer-off-dolly method, picking dents, unlocking on a hammer &amp; dolly, straightening with body spoons, other metal straightening method-paint removal, pulling dents, spot-weld dent pullers, metal shrinking, stress relieving, stretched metal, Principle of shrinking , shrinking steel panel with heat, Kinking, shrinking a gouge, filing the repair area,</p>



		working Aluminum panels, working Aluminum with hammer and dolly, straightening aluminum with hammer, filling and grinding aluminum, straightening aluminum by heat shrinkage, Paint less dent removal method.
15.	Practice on Bumper Repair Techniques.	Repairing Plastics Introduction to plastics, Types of Plastics- Thermoplastics, thermosetting plastics, safety points observed while working with plastic repair, common automotive plastics identification, plastic repair, chemical adhesive bonding techniques- repair of minor cuts and cracks, repair of tears, and punctures, using the right adhesive, Flexible part repair- Plastic welding, Hot air plastic welding, High speed plastic welds, plastic welder setup shutdown, and servicing, Airless plastic welding, ultrasonic plastic welding, plastic welding procedures, general plastic welding, techniques, Plastic tack welding, plastic welding procedures, airless melt-flow plastic welding, plastic stitch- tamp welding, single-sided plastic welds, two sided plastic welds, repairing vinyl, using heat to reshape plastics, ultrasonic stud welding, reinforced plastic repairs.
16.	Demonstration of Basics of Fender Repair	Hood, Bumper, Fender, Lid, And Trim Service Part removal Sequence, Hood service- Hood removal, Hood adjustment, Hood-to-hinge adjustment, hood height adjustment, hood latch mechanism, hood latch adjustments, Bumper replacements, Fender service- Fender removal, installing fenders, fender adjustments, grille service, Trunk lid adjustments, panel alignment, Truck bed service, sound- Deadening pads, custom body panels, installing body trim and moldings, removing adhesive held moldings, installing adhesive body sine moldings.
17.	<b>Identify Door, Roof and Glass Fitments</b>	Door, roof, and glass Service Vehicle Glass Technology- Introduction, type of glass-laminated, plate glass, tempered glass, glass service- removing windshield molding, windshield rubber gasket service, Glass adhesive-full cut-out method, glass adhesive, partial cutout method, windshield wiper service, rear and quarter window service, service doors-door construction, manual & power regulators, checking door operation, door removal, door weather strip

		<p>service, Door inner trim panel Door window regulator service, door lock &amp; latch service, Door reinforcements, panel adhesive technology, Replacing bonded door skins, replacing SMC( Sheet molded compound) Door skins, Door &amp; Door glass adjustments, servicing welded door hinges, bolted door hinge adjustment, Door glass service- Door glass adjustment, door trim panel installation tailgate glass service, station wagon tailgate adjustment, Glass element repairs, rear view mirror service, roof panel service, fastened roof panel service, convertible top service, Sun roof service</p>
18.	<b>Identify Different Trim Assemblies.</b>	<p>Passenger compartment Service Major parts of Passenger Compartment - dash assembly, instrument cluster, seat assemblies, interior trim, steering column assembly, headliner assembly, carpeting, weather stripping, Interior trim-pillar trim panels, dash panel, door trim panels, Glass trim panels, sill plates, interior trim service-procedure, roll bars, seat service- Front seat service, Rear bench seat service, seat cover service, carpeting service, dash panel service, console service, Instrument cluster service, Headliner service, locating air and water leaks- checking drain hoses, wind noise.</p>
19.	<b>Basic Measuring Practice. Identify the Impact of damage.</b>	<p>Major Body/frame damage Measurement Vehicle measurement-collision repair process, diagnostic procedure for collision damage, impact and its effects on a vehicle-Determining the condition of collision, influence of impact on a body-over-frame vehicle, Frame deformation-sideway damage, sag damage, mash damage, diamond damage, twist damage, impact effect on unibody vehicles- primary damage area, secondary damage area, collision damage sequence, visually determine the extent of impact damage, inspecting for damage from passengers &amp; luggage, body dimensions- body dimension charts, vehicle measuring basics, measurement importance, Gauge measuring system- trame gauge, upper body dimensioning, measurement of the front body, measurement of the body side panel, measurement of the rear body, digital tram gauges, dimensional references, the centre panel, zero planes, diagnosing damage, measuring Vehicle Impact and Its Effects on a vehicle, Visually Determining the Extent of</p>

		Impact Damage, Measurement of Body Dimensions, Gauge Measuring System, Tram Gauges, Digital Tram Gauges, Centering Gauges.
20.	<b>Practice on Body Dimension</b>	Unibody/frame alignment Realignment basics-vehicle anchoring and pulling, pulling direction, single-pull method, multiple-pull Method, visualizing front-end Collisions, rear-end collisions, side collision, rollover damage, angled impacts, unibody/Frame Straightening Equipment, in-floor straightening equipment-anchor-pot system and the modular rail frame system. portable body and frame pullers, rack (floor) straightening systems, bench straightening systems, anchoring the vehicle using pulling clamps and chains, other straightening accessories- restraint bar , door aligner, engine holder, portable hydraulic rams, strut plate, straightening and realigning techniques-sequence for a total structure realignment procedure , unibody/frame realignment safety, measuring when pulling, computerized measuring systems, procedure for planning the pull, making pulls-single-pull setup, multiple-pull setups, executing a pulling sequence, purpose of over pulling.

**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 12<sup>th</sup> / 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	<b>Block - I</b>
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	
	<b>TOTAL</b>	<b>110 hrs.</b>	<b>50</b>	

## Detail of Syllabus

<b>1. English Literacy</b> <b>Hours of Instruction: 20 Hrs.</b>		<b>Marks Allotted: 09</b>
<b>Pronunciation</b>	Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)	
<b>Functional Grammar</b>	Transformation of sentences, Voice change, Change of tense, Spellings.	
<b>Reading</b>	Reading and understanding simple sentences about self, work and environment	
<b>Writing</b>	Construction of simple sentences Writing simple English	
<b>Speaking / Spoken English</b>	Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Cardinal (fundamental) numbers ordinal numbers. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.	
<b>2. I.T. Literacy</b> <b>Hours of Instruction: 20 Hrs.</b>		<b>Marks Allotted: 09</b>
<b>Basics of Computer</b>	Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.	
<b>Computer Operating System</b>	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.	
<b>Word processing and Worksheet</b>	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	
<b>Computer Networking and INTERNET</b>	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,	

	<p>Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication.</p> <p>Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes.</p>
<p><b>3. Communication Skills</b>  <b>Hour of Instruction: 15 Hrs.</b> <span style="float: right;"><b>Marks Allotted: 07</b></span></p>	
<b>Topic</b>	<b>Contents</b>
<b>Introduction to Communication Skills</b>	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.
<b>Listening Skills</b>	Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening.
	Triple- A Listening - Attitude, Attention & Adjustment.
	Active Listening Skills.
<b>Motivational Training</b>	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.
<b>Facing Interviews</b>	Manners, Etiquettes, Dress code for an interview
	Do's & Don'ts for an interview
<b>Behavioral Skills</b>	Problem Solving
	Confidence Building
	Attitude
<p><b>4. Entrepreneurship Skills</b>  <b>Hour of Instruction: 15 Hrs.</b> <span style="float: right;"><b>Marks Allotted: 06</b></span></p>	
<b>Concept of Entrepreneurship</b>	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.
<b>Project Preparation &amp; Marketing analysis</b>	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.
<b>Institutions Support</b>	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.
<b>Investment Procurement</b>	Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.
<b>5. Productivity</b>	
<b>Hour of Instruction: 10 Hrs. Marks Allotted: 05</b>	
<b>Benefits</b>	Personal / Workman - Incentive, Production linked Bonus, Improvement in living standard. Industry Nation.
<b>Affecting Factors</b>	Skills, Working Aids, Automation, Environment, Motivation How improves or slows down.
<b>Comparison with developed countries</b>	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.
<b>Personal Finance Management</b>	Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.
<b>6. Occupational Safety, Health and Environment Education</b>	
<b>Hour of Instruction: 15 Hrs. Marks Allotted: 06</b>	
<b>Safety &amp; Health</b>	Introduction to Occupational Safety and Health importance of safety and health at workplace.
<b>Occupational Hazards</b>	Basic Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.
<b>Accident &amp; safety</b>	Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.
<b>First Aid</b>	Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person
<b>Basic Provisions</b>	Idea of basic provision of safety, health, welfare under legislative of India.



### **Tools & Equipments for Employability Skills:**

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

9.	Dimensioning practice: <ul style="list-style-type: none"> <li>- Position of dimensioning (unidirectional, aligned, as per BIS SP:46-2003)</li> <li>- Types of arrowhead</li> <li>- Leader Line with text</li> <li>- Symbols preceding the value of dimension and dimensional tolerance.</li> </ul>
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"> <li>- Concept of axes plane and quadrant.</li> <li>- Orthographic projections</li> <li>- Method of first angle and third angle projections (definition and difference)</li> <li>- Symbol of 1<sup>st</sup> angle and 3<sup>rd</sup> angle projection as per IS specification.</li> </ul>
14.	Drawing of Orthographic projection in 3 <sup>rd</sup> 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 & EQUIPMENT**

<b>Sl. No.</b>	<b>NAME OF TOOLS / EQUIPMENTS</b>	<b>QUANTITY</b>
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 144 Engineering 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><b>Unit:</b> Systems of unit- FPS, CGS, MKS/SI unit,  Unit of length, Mass and time.  Conversion of units.</p>	<p><b>Material Science :</b> Definition, properties (physical &amp; mechanical) and uses of Metal, Non-metal, Alloy &amp; Insulator.  Types of ferrous and Non-ferrous metals.  Difference between Ferrous and Non-Ferrous metals.</p>
2.	<p><b>Basic Mathematics</b> - BODMAS rule Fraction-Addition, Subtraction, multiplication and Division-Problem solving, Decimal-Addition.  Simple calculation using Scientific Calculator.</p>	<p><b>Mass, Weight and Density:</b> Mass, Unit of Mass, Weight, difference between mass and weight.  Density, unit of density. Relation between mass, weight &amp; density.  Simple problems related to mass, weight, and density.</p>
3.	Conversion of Fraction to Decimal and vice-versa.	
4.	<b>Ratio &amp; Proportion:</b> Simple calculations & related problems solving.	
5.	<p><b>Percentage:</b> Introduction, Simple calculation.  Changing percentage to fraction and decimal &amp; vice-versa.</p>	
6.	<p><b>Basic Algebra:</b> Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).</p>	<p><b>Elasticity:</b> Elastic &amp; Plastic material. Stress &amp; strain and their units. Young's modulus. Ultimate stress and breaking stress.</p>
7.	<p><b>Mensuration :</b> 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><b>Heat &amp; Temperature:</b> Heat and temperature, their units, difference between heat and temperature, boiling point, melting point,  Scale of temperature, relation between different scale of temperature.  Thermometer, pyrometer.  Transmission of heat, conduction, convection, radiation.</p>

8.		<b>Basic Electricity:</b> Introduction and use of Electricity.  AC, DC & their comparisons. Current, Voltage, Resistance & their units.  Power, Energy & their units.  Insulator and conductors & their uses.
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## **BLOCK – II**

DURATION: 05MONTHS (22 weeks)

### **Industry level training**

### **BROAD LEARNING TO BE COVERED IN INDUSTRY FOR MECHANIC AUTO BODY REPAIR TRADE:**

1. Safety and best practices /Basic Industrial Culture (5S, KAIZEN, etc.)
2. Record keeping and documentation
3. Practical skills on SMAW process
4. Practical skills on GMAW process
5. Practical skills on GTAW process
6. Practical skills on Welding Inspection and Testing

### **DETAILS OF PRACTICAL SKILLS TO BE COVERED DURING INDUSTRY TRAINING FOR- MECHANIC AUTO BODY REPAIR**

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: -

#### **Body Repair**

1. Damage Assessment and repair Process.
  - Perform Single panel Damage repair using dolly hammer for dent removal.
  - Analyse damage of edge lines and use techniques like washer welding/pulling technique/( Dent Puller).
  - Perform Medium damage analysis.
  - Carry out Repair using Pneumatic tools, stripping & replacement of Glass, Power window etc.
2. Perform Welding.
  - Carryout MIG Welding, Spot welding, shrinking.
  - Perform cutting operation using Plasma Cutter, -Perform oxyacetylene welding. Carryout Plastic Repair job.
3. Perform Heavy damage analysis and Repair Process. -Using Chassis aligner, dimensioning, repair and replacement technique.-Carryout measurement using Tracking Gauge.
4. Perform Final Inspection.
5. Perform Preventive maintenance of Tools and Equipment used.

#### **Theory to be covered during Industrial Training:**

- 1)Explain Damage Assessment and Repair Process.
- 2)Describe MIG Welding, Spot Welding and Shrinking as per Industries perspectives.
- 3)Explain Plasma Cutter and its working with safety.
- 4)Description of process of usage of pneumatic tools and its uses in Glass replacement.
- 5)Explain Plastic Repair Process.

6) Describe Heavy damage analysis and Repair process and how to perform final inspection.

**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 REPAIR (Dual mode)**  
**LIST OF TOOLS & EQUIPMENT FOR 16 TRAINEES**

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

<b>Sl. No.</b>	<b>Item with specification</b>	<b>Qty (Nos.)</b>
1.	Allen Key set of 12 pieces (2mm to 14mm)	(4+1)
2.	Body hammer (long pick)	5
3.	Body hammer, cross chisel (finishing hammer)	5
4.	Body hammer, utility pick (short pick)	5
5.	Caliper inside 15 cm Spring	5
6.	Calipers outside 15 cm spring	5
7.	Center Punch 10 mm. Dia. x 100 mm.	5
8.	Different type of spoon	5
9.	Dividers 15 cm Spring	5
10.	Electrician Screw Driver 250mm	5
11.	General purpose dolly	5
12.	Hammer ball peen 0.5 kg with handle	5
13.	Hands file 20 cm. Second cut flat	5
14.	Pliers combination 20 cm.	5
15.	Safety glasses	5

<b>Sl.No.</b>	<b>Item with specification</b>	<b>Qty. (Nos)</b>
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.	Caliper inside 15 cm Spring	4
13.	Calipers outside 15 cm spring	4
14.	Car Jet washer with standard accessories	1
15.	Chain Pulley Block-3 ton capacity with tripod stand	1
16.	Chisel 10 cm flat	4
17.	Chisels cross cut 200 mm X 6mm	4
18.	Circlip pliers Expanding and contracting type 15cm and 20cm each	4
19.	Clamps C 100mm	4
20.	Clamps C 150mm	4
21.	Clamps C 200mm	4
22.	Cleaning tray 45x30 cm.	4
23.	Collapsible panel stands	2
24.	Copper bit soldering iron 0.25 Kg	4
25.	Crow bar 910 x25mm	2
26.	Cylinder bore gauge capacity 20 to 160 mm	2
27.	DC Ohmmeter 0 to 300 Ohms, mid scales at 20 Ohms	2
28.	Depth micrometer 0-25mm	4
29.	Dial gauge type 1 Gr. A (complete with clamping devices and stand)	4
30.	Different type of Bumping hammers	1 set
31.	Different type of -body hammers	1 set
32.	Different type of body picks	1 set
33.	Different type of body spoon	1 set
34.	Different type of dolly block	1 set
35.	Different type of finishing hammers	1 set
36.	Different type of pick hammers	1 set
37.	Digital thermometer	2
38.	Dividers 15 cm Spring	4
39.	Door handle tool (clip pullers)	1
40.	Drift Punch Copper 15 Cm	4
41.	Drill point angle gauge	1
42.	Drill twist 1.5 mm to 15 mm (various sizes) by 0.5 mm	4
43.	Electric Soldering Iron 230 V 60 watts 230 V 25 watts	2 each
44.	Electric testing screw driver	2
45.	Engineer's square 15 cm. Blade	4
46.	Feeler gauge 20 blades (metric)	2
47.	File flat 20 cm bastard	4

48.	File, half round 20 cm second cut	4
49.	File, Square 20 cm second cut	4
50.	File, Square 30 cm round	4
51.	File, triangular 15 cm second cut	4
52.	Files assorted sizes and types including safe edge file (20 Nos)	2 set
53.	Flat File 25 cm second cut	4
54.	Flat File 35 cm bastard	4
55.	Garage rack	2
56.	Granite surface plate 1600 x 1000 with stand and cover	1
57.	Grease Gun	2
58.	Grip Wrench 200mm	2
59.	Growler	1
60.	Hacksaw frame adjustable 20-30 cm	10
61.	Hammer Ball Peen 0.75 Kg	2
62.	Hammer Chipping 0.25 Kg	5
63.	Hammer copper 1 Kg with handle	4
64.	Hammer Mallet	4
65.	Hammer Plastic	4
66.	Hand operated crimping tool (i) for crimping up to 4mm and (ii) for crimping up to 10mm	2
67.	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
68.	Hand Shear Universal 250mm	2
69.	Hand vice - 37 mm	2
70.	Hollow Punch set of seven pieces 6mm to 15mm	2 sets each
71.	Insulated Screw driver 20 cm x 9mm blade	4
72.	Insulated Screw driver 30 cm x 9mm blade	4
73.	Interchangeable driver set	1 set
74.	Lead light	2
75.	Left cut snips 250mm	4
76.	Lifting jack screw type 3 ton capacity	4
77.	Magneto spanner set with 8 spanners	1 set
78.	Magnifying glass 75mm	2
79.	Marking out table 90X60X90 cm.	1
80.	Multimeter digital	5
81.	Oil can 0.5/0.25 liter capacity	2
82.	Oil Stone 15 cm x 5 cm x 2.5 cm	1
83.	Outside micrometer 0 to 25 mm	4
84.	Outside micrometer 25 to 50 mm	4
85.	Outside micrometer 50 to 75 mm	1

86.	Outside micrometer 75 to 100 mm	1
87.	Panel assembly hold/support arms	2
88.	Panel cutter (two-way nibbler)	1
89.	Philips Screw Driver set of 5 pieces (100 mm to 300 mm)	2 sets
90.	Pipe cutting tool	2
91.	Pipe flaring tool	2
92.	plastic feeler gauges	2
93.	Pliers combination 20 cm.	2
94.	Pliers flat nose 15 cm	2
95.	Pliers round nose 15 cm	2
96.	Pliers side cutting 15 cm	2
97.	Portable electric drill Machine	1
98.	Prick Punch 15 cm	4
99.	Punch Letter 4mm (Number)	2 set
100.	Right cut snips 250mm	4
101.	Rivet sets snap and Dolly combined 3mm, 4mm, 6mm	4
102.	Scraper flat 25 cm	2
103.	Scraper half round 25 cm	4
104.	Scraper Triangular 25 cm	4
105.	Scriber 15 cm	4
106.	Scriber with scribing black universal	2
107.	Set of stock and dies - Metric	2 sets
108.	Shear Tin Man's 450 mm x 600mm	4
109.	Sheet metal cutting pliers-left , right hand and straight -jaw	1 set
110.	Sheet Metal Gauge	2
111.	Sher Tinmans 300mm	4
112.	Soldering Copper Hatchet type 500gms	4
113.	Solid Parallels in pairs (Different size) in Metric	2
114.	Spanner Clyburn 15 cm	1
115.	Spanner D.E. set of 12 pieces (6mm to 32mm)	4
116.	Spanner T. flocks for screwing up and up-screwing inaccessible	2
117.	Spanner, adjustable 15cm.	2
118.	Spanner, ring set of 12 metric sizes 6 to 32 mm.	2
119.	Spanners socket with speed handle, T-bar, ratchet	2
120.	Spark lighter	2
121.	Spark plug spanner 14mm x 18mm x Size	2
122.	Spirit level 2 V 250, 05 metre	2
123.	Steel measuring tape 10 meter in a case	4
124.	Steel rule 15 cm inch and metric	4
125.	Steel rule 30 cm inch and metric	4

126.	Steel wire Brush 50mmx150mm	4
127.	Straight edge gauge 2 ft.	2
128.	Straight edge gauge 4 ft.	2
129.	Stud extractor set of 3	2 sets
130.	Stud remover with socket handle	1
131.	Suction cup	2
132.	Surface gauge with dial test indicator plunger type i.e. 0.01 mm	2
133.	Taps and Dies complete sets (5 types)	1 set
134.	Taps and wrenches - Metric	2 sets
135.	Telescope gauge	4
136.	Thread pitch gauge metric, BSW	1
137.	Torque wrenches 5-35 Nm, 12-68 Nm & 50-225 Nm	1 each
138.	Trammel 30 cm	2
139.	Trim and upholstery tools	1 set
140.	Tyre pressure gauge with holding nipple	2
141.	Universal puller for removing pulleys, bearings	1
142.	V' Block 75 x 38 mm pair with Clamps	2
143.	Vacuum gauge to read 0 to 760 mm of Hg.	2
144.	vernier caliper 0-300 mm with least count 0.02mm	4
145.	Vice grip pliers	2
146.	Voltmeter 50V/DC	5
147.	Wire Gauge (metric)	5
148.	Work bench 250 x 120 x 60 cm with 4 vices 12cm Jaw	4

### 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 measurement tools- Gunsight, trammel gauge, 2m straight edge & Measuring tape	2 each
6.	Body repair hand tools - Various hammers, dollies, spoons, files, line chisel, hacksaw, clamps, & sanding blocks	2 each
7.	Body shell - Light Motor vehicle of different Manufactures	4
8.	Bonded auto glass removal & replacement tools	2
9.	Caulking / panel seam sealer / panel adhesive application gun	2
10.	Chassis alignment equipment (incorporating measurement system)	1
11.	compressed air line -10m (on retractable reel, with high	2

	flow connectors) with FRL unit	
12.	Die Grinding kit	2
13.	Disc sander - 18 cm	2
14.	Discrete Component Trainer / Basic Electronics Trainer	1
15.	Drilling machine bench to drill up to 12mm dia along with accessories	1
16.	Dual Magnetization Yoke : AC / HWDC, 230 VAC, 50Hz	1 set
17.	Dust extraction connections (Vacumm)	2
18.	Electronic heat shrinking equipment (carbon rod, induction or copper	1
19.	Gas Welding Table 1220mm x760mm	1
20.	Grinding machine (general purpose) D.E. pedestal with 300 mm dia wheels rough and smooth	1
21.	Hydraulic jack HI-LIFT type -3 ton capacity, 5 ton capacity	1each
22.	Infrared drying lamp unit	1
23.	Liquid penetrant Inspection kit	1 set
24.	MIG welding machine complete set 400Amps	2
25.	Motor Vehicle suitable for Body shop repair -Light Motor vehicle of different Manufactures	2
26.	Oxy-acetylene welding equipment with complete accessories ( Low & high	2
27.	PipeBending Machine (Hydraulic type) 12mm to 30mm	1
28.	Plasma cutter	1
29.	Pneumatic rivet gun	2
30.	Power hacksaw kit	2
31.	Random /dual action orbital sander (12-15 cm)	2
32.	Spot weld cutter- Drill type, Hole saw type	1
33.	Spot weld removal kit / drill along with accessories	2
34.	Spot welder (single and double sided)	2
35.	Tin smiths bench folder 600 x 1.6mm	1
36.	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
37.	Weld through primer application equipment	2
38.	Welding plant Oxy-Acetylene complete ( high pressure)	2
39.	Welding Transformer ( 200 to 400 Amps)	2
40.	Weld-on pin/ ring panel puller kit	2

## 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**

<b>Sl. No.</b>	<b>Name &amp; Designation</b>	<b>Organization</b>	<b>Remarks</b>
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, Principale	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. Maharashtra	Member
10.	D. K. Sharma, MD	Technology Exchange Services Pvt. Ltd., Ahmedabad	Member
11.	Mr. Raj Kava, Proprietor	Kava Automobiles, Gujarat	Member
12.	Mr. M. K. Deshmukh, Partner	R. S. Automobiles, Mumbai	Member
13.	Mr. Alok Dhanuka, G. M. (Service)	Dhhrivil Automobile LLP, Gujarat	Member
14.	Mr. Umesh Panchal, Service Manager	Popular Wheelers (India) Pvt. Ltd.	Member