

MOTOR VEHICLE BODY BUILDER

COMPETENCY BASED CURRICULUM

(Duration: 2 Yrs.)

APPRENTICESHIP TRAINING SCHEME (ATS)

NSQF LEVEL- 5



SECTOR – AUTOMOBILE

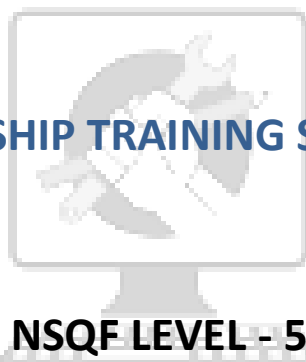


GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

MOTOR VEHICLE BODY BUILDER

(Revised in 2018)

APPRENTICESHIP TRAINING SCHEME (ATS)



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Developed By

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1.1 Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate (ITI pass-outs) issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry. There are four categories of apprentices namely; **trade apprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by NCVT and those successful in the trade tests are awarded the National Apprenticeship Certificate.

The period of apprenticeship training for graduate (engineers), technician (diploma holders) and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

1.2 Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger proportion of apprentices, will be critical to success; as will stronger collaboration between industry and the trainees to ensure the supply of skilled workforce and drive development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

1.3 Reformation

The Apprentices Act, 1961 has been amended and brought into effect from 22nd December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.
- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.
- Scope has been extended also to non-engineering occupations.
- Establishments have been permitted to outsource basic training in an institute of their choice.
- The burden of compliance on industry has been reduced significantly.



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2.1 GENERAL

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

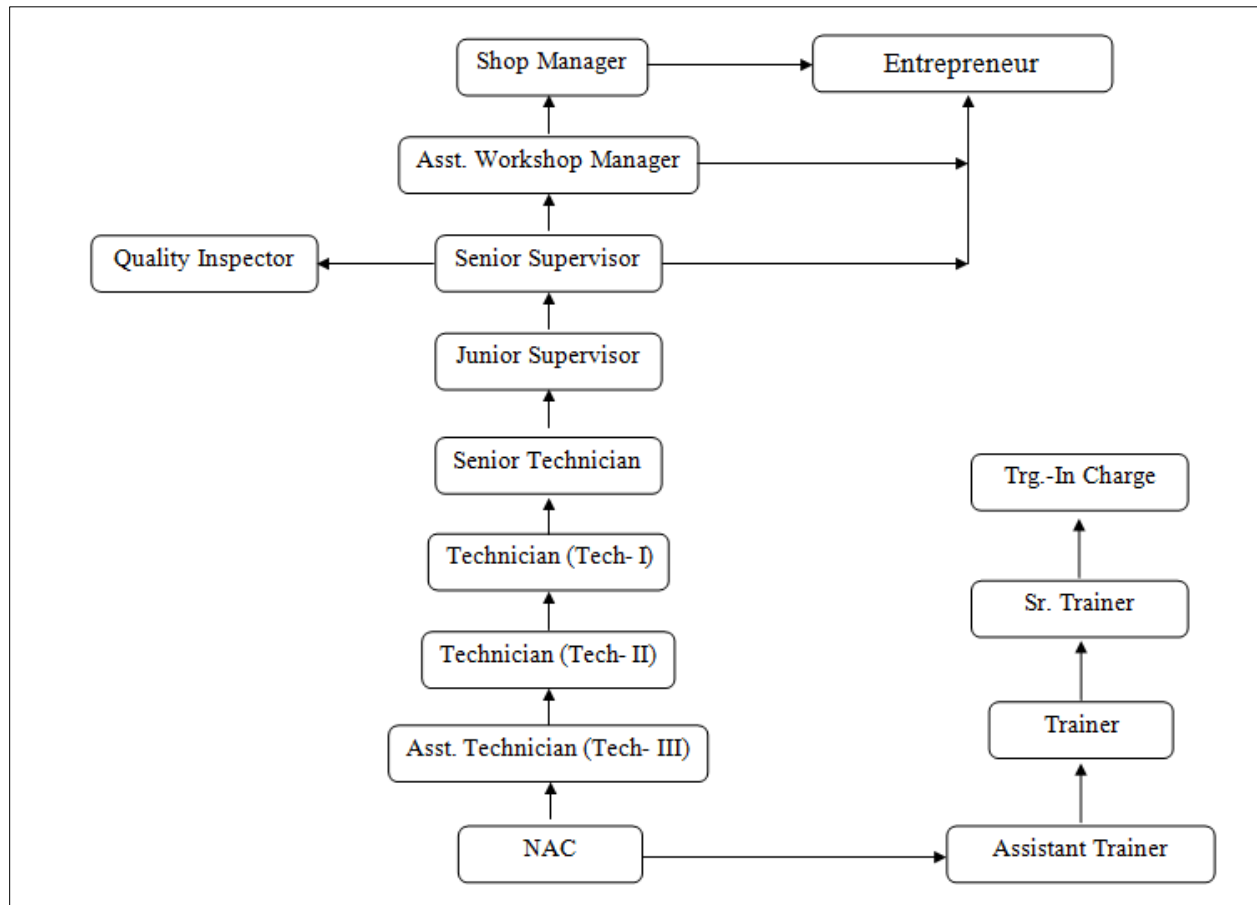
MOTOR VEHICLE BODY BUILDER trade under ATS is one of the most popular courses delivered nationwide through different industries. The course is of two years (02 Blocks) duration. It mainly consists of Domain area and Core area. In the Domain area Trade Theory & Practical impart professional - skills and knowledge, while Core area - Workshop Calculation and science, Engineering Drawing and Employability Skills imparts requisite core skills & knowledge and life skills. After passing out the training programme, the trainee is being awarded National Apprenticeship Certificate (NAC) by NCVT having worldwide recognition.

Broadly candidates need to demonstrate that they are able to:

- Read & interpret technical parameters/document, plan and organize work processes, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge, core skills & employability skills while performing jobs and solve problem during execution.
- Check the job/assembly as per drawing for functioning, identify and rectify errors in job/assembly.
- Document the technical parameters related to the task undertaken.

2.2 CAREER PROGRESSION PATHWAYS:

- Indicative pathways for vertical mobility.



2.3 COURSE STRUCTURE:

Table below depicts the distribution of training hours across various course elements during a period of two years (*Basic Training and On-Job Training*) :-

Total training duration details: -

Time (in months)	1-3	4-12	13-15	16-24
Basic Training	Block– I	-----	Block – II	-----
Practical Training (On - job training)	----	Block – I	-----	Block – II

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A. Basic Training

For 02 yrs. Course (Engg.) :-(**Total 06 months:** 03 months in 1styr. + 03 months in 2nd yr.)

For 01 yr. Course (Engg.):-(**Total 03 months:** 03 months in 1styr.)

S No.	Course Element	Total Notional Training Hours	
		For 02 Yrs. course	For 01 Yr. course
1.	Professional Skill (Trade Practical)	550	275
2.	Professional Knowledge (Trade Theory)	240	120
3.	Workshop Calculation & Science	40	20
4.	Engineering Drawing	60	30
5.	Employability Skills	110	55
	Total (Including internal assessment)	1000	500

B. On-Job Training:-

For 02 yrs. Course (Engg.) :-(**Total 18 months:** 09 months in 1styr. + 09 months in 2nd yr.)

Notional Training Hours for On-Job Training: 3120 Hrs.

For 01 yr. course (Engg.) :-(**Total 12 months**)

Notional Training Hours for On-Job Training: 2080 Hrs.

C. Total training hours:-

Duration	Basic Training	On-Job Training	Total
For 02 yrs. Course (Engg.)	1000 hrs.	3120 hrs.	4120 hrs.
For 01 yr. Course (Engg.)	500 hrs.	2080 hrs.	2580 hrs.

2.4 ASSESSMENT & CERTIFICATION:

The trainee will be tested for his skill, knowledge and attitude during the period of course and at the end of the training programme as notified by Govt of India from time to time. The Employability skills will be tested in first two semesters only.

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a) The **Internal assessment** during the period of training will be done by **Formative assessment method** by testing for assessment criteria listed against learning outcomes. The training institute have to maintain individual *trainee portfolio* as detailed in assessment guideline (section-2.4.2). The marks of internal assessment will be as per the template (Annexure – II).

b) The final assessment will be in the form of summative assessment method. The All India Trade Test for awarding NAC will be conducted by NCVT on completion of course as per guideline of Govt of India. The pattern and marking structure is being notified by govt of India from time to time. **The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check** individual trainee's profile as detailed in assessment guideline (section-2.4.2) before giving marks for practical examination.

2.4.1 PASS REGULATION

The minimum pass percent for Practical is 60% & minimum pass percent for Theory subjects 40%. The candidate pass in each subject conducted under all India trade test.

2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking assessment. Due consideration should be given while assessing for team work, avoidance/reduction of scrap/wastage and disposal of scarp/wastage as per procedure, behavioral attitude, sensitivity to environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work

Evidences of internal assessments are to be preserved until forthcoming semester examination for audit and verification by examination body. The following marking pattern to be adopted while assessing:

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Performance Level	Evidence
(a) Weightage in the range of 60 -75% to be allotted during assessment	
For performance in this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.	• Demonstration of good skill in the use of hand tools, machine tools and workshop equipment • Below 70% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A fairly good level of neatness and consistency in the finish • Occasional support in completing the project/job.
(b)Weightage in the range of above75% - 90% to be allotted during assessment	
For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship.	• Good skill levels in the use of hand tools, machine tools and workshop equipment • 70-80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A good level of neatness and consistency in the finish • Little support in completing the project/job
(c) Weightage in the range of above 90% to be allotted during assessment	
For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	• High skill levels in the use of hand tools, machine tools and workshop equipment • Above 80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.

Brief description of Job roles:

Body Builder, Automobile constructs rigid body on auto-chassis with or without super-structure using wood and metal frames for passenger buses, goods trucks, lorries, vans, etc. Studies sketches or blue print regarding type of body to be built. Selects required sizes of timber pieces and collects finished metal parts. Cuts and shapes wood for body using hand or power tools. Builds frame work, lining, floors, ceiling and other wooden parts according to drawing and other specifications. Fits longitudinal runners, cross barriers, vertical posts etc. and tightens frame rigidly to chassis. Fits assembled or welded metal frame over wooden longitudinal runners and cross members and assembles metal panel, roof covers, doors, etc., to wooden frame using nuts and bolts, etc., to wooden attachments such as fasteners, handles, hooks, lockers, etc., to frame or body as required. May fix interior fittings and repair or replace parts. May specialize in building any particular type of coach such as ambulance vans, passenger buses, army vehicles, goods lorries etc.

Body Builder, Other Vehicles assembles and repairs wooden parts of vehicle body on metal frame with specified seating and other arrangements and screws masonite, wooden planks, hard boards, plywood etc., according to specifications for constructing bodies of vehicles not elsewhere classified such as cycle rickshaw, auto rickshaw etc. (excluded are CART BUILDERS AND WHEEL WRIGHTS). Takes exact measurements of metal body for cutting required sizes of wooden parts. Cuts wooden plank, masonite or hard board to required sizes using hand saw and drills holes with hand drill. Fits cut pieces of plank, or board over metal frame and secures them tightly with bolts and nuts, or screws as required. May fit cushions, seats, arms rests and hoods to rickshaws.

Plan and organize assigned work and detect & resolve issues during execution. Demonstrate possible solutions and agree tasks within the team. Communicate with required clarity and understand technical English. Sensitive to environment, self-learning and productivity.

Perform TPM (Total Production Management), TQM (Total Quality Management) and record keeping system.

Reference NCO:

- i). 7522.0600 – Body Builder, Automobile
- ii). 7522.0800 – Body Builder, Other Vehicles

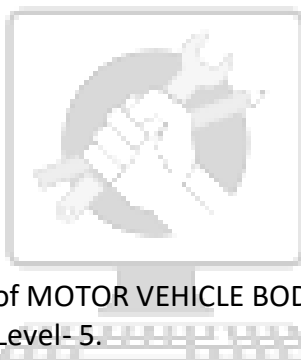
NSQF level for MOTOR VEHICLE BODY BUILDER trade under ATS: **Level 5**

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

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

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

- a. Process
- b. Professional knowledge,
- c. Professional skill,
- d. Core skill and
- e. Responsibility.



The Broad Learning outcome of MOTOR VEHICLE BODY BUILDER trade under ATS mostly matches with the Level descriptor at Level- 5.

The NSQF level-5 descriptor is given below:

Level	Process required	Professional knowledge	Professional skill	Core skill	Responsibility
Level 5	Job that requires well developed skill, with clear choice of procedures in familiar context.	knowledge of facts, principles, processes and general concepts, in a field of work or study	a range of cognitive and practical skills required to accomplish tasks and solve problem by selecting and applying basic methods, tools, materials and information.	Desired mathematical skill, understanding of social, political and some skill of collecting and organizing information, communication.	Responsibility for own work and Learning and some responsibility for other's works and learning.

Name of the Trade	MOTOR VEHICLE BODY BUILDER
NCO - 2015	7522.0600, 7522.0800
NSQF Level	Level – 5
Duration of Apprenticeship Training (Basic Training + On-Job Training)	Two years (02 Blocks each of one year duration).
Duration of Basic Training	a) Block –I : 3 months b) Block – II : 3 months Total duration of Basic Training: 6 months
Duration of On-Job Training	a) Block–I: 9 months b) Block–II : 9 months Total duration of Practical Training: 18 months
Entry Qualification	Passed 10 th Class with Science and Mathematics under 10+2 system of Education or its equivalent
Selection of Apprentices	The apprentices will be selected as per Apprenticeship Act amended time to time.
Instructors Qualification for Basic Training	As per ITI instructors qualifications as amended time to time for the specific trade.
Infrastructure for Basic Training	As per related trade of ITI
Examination	The internal examination/ assessment will be held on completion of each block. Final examination for all subjects will be held at the end of course and same will be conducted by NCVT.
Rebate to Ex-ITI Trainees	One year in the trade of Sheet Metal Worker/ Welder (Gas & Electric).
CTS trades eligible for MOTOR VEHICLE BODY BUILDER Apprenticeship	1. Sheet Metal Worker 2. Welder (Gas & Electric).

Note:

- Industry may impart training as per above time schedule for different block, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspects is compromised.
- For imparting Basic Training the industry to tie-up with ITIs having such specific trade and affiliated to NCVT.

6.1 GENERIC LEARNING OUTCOME

The following are minimum broad Common Occupational Skills/ Generic Learning Outcome after completion of the MOTOR VEHICLE BODY BUILDER course of 02 years duration under ATS.

Block I & II:-

1. Recognize & comply safe working practices, environment regulation and housekeeping.
2. Understand and explain different mathematical calculation & science in the field of study including basic electrical. *[Different mathematical calculation & science -Work, Power & Energy, Algebra, Geometry & Mensuration, Trigonometry, Heat & Temperature, Levers & Simple machine, graph, Power transmission, Pressure]*
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Rivets, Joints& different thread forms, Assembly drawing, Sectional views, Electrical & electronic symbol]*
4. Select and ascertain marking, measuring& cutting instrument and measure dimension of components and record data.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.
8. Plan and organize the work related to the occupation.

6.2 SPECIFIC LEARNING OUTCOME

Block – I

1. Safety and best practices/Basic Industrial Culture (5S, KAIZEN, etc.)
2. Prepare different types of documentation as per industrial need by different methods of recording information.
3. Use of Common hand tools used in the shop floor such as hammer, chisel, hacksaw, steel rule, dividers, calipers, punches, shears, blow lamp, protractor, vernier, centre punch, scribe, D.E. spanner, Ring spanner, Torque Wrench for 'IT clamping, screw driver. Bench vice. Grinding Machine and Box spanner-special types of fabrication spanners to suit the assembly conditions.

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4. Marking on Sheet Metal, Shearing, Bending, Notching, Punching for pillars, Waist rail etc. Explain the body structure parts and materials.
5. Handling of different types of grinding machines such as modified Angular. Automatic and Flexible.
6. Lighting and maintenance of forge by manual and power.
7. Simple forging operations such as Hammering Square, round, Flat, Hexagon, Octagon, Tapered sections and Jumping.
8. Hand forging operations such as Cold and Hot bending. Spreading, Upsetting, Drawing, Shouldering, Punching, Drifting, Forge welding and Shrinking.
9. Grinding of forged articles and hand tools including drill bits.
10. Simple heat treatment operations such as Hammering, Tempering, Normalising, Annealing, Casehardening. Recambering process of leaf springs and pre-treatment of phosphating (in cold and hot process) Galvanizing and Sheradizing process.
11. Riveting and Riveted joints (Hot and Cold) Practice on riveting by using Pop rivets. Aluminium (solid) Copper Rivet M.S. Rivet. Tubler Rivet and Bifurcated Rivet and its use.
12. Simple welding (Gas & Electric) including brazing. Use of 'Spot Welding equipment in Sheet Metal'. Practice on Gas cutting Gas cutting of sheets. Tig and Mig welding. Practice on Arc Welding types such as: (1) Vertical downward, (2) Vertical upward, (3) Horizontal welding positions and cutting practice. Types of Electrodes, checking of good quality electrodes, cutting rods and metal sprays.
13. Marking out as per drawing and cutting off sheet metal by using hand lever shears and Nibbling shears.
14. Soldering, Tinning and Brazing and simple sheet metal operations such as Bending, Rolling, Shaping, Flanging, Edging, Hollowing, reinforcement of sheet metal components.
15. Allied forming and cutting operations such as Folding Flaring and Trepanning.
16. Annealing of copper, Cutting, Bending and Soldering of copper tubes.
17. Use of hand operated machines such as Guillotine shearing Machine. Grooving M/C, Folding M/C, Turning M/C, Wiring M/C, Beading M/C, Circle cutting M/C, Pillar type drilling M/C, Fly press Nibbling M/C, Flat cutting M/C with channels and angles and practice in bending square-tube and hat sections for roof stick and side pillar manually and pneumatically.
18. Introduction of F.R.P. materials and method of fabricating of components and its salient feature.

BLOCK – II

19. Instructions in Safety precautions on the Shop Floor and Environmental standards.
20. Practice in use of machines utilized in Motor Vehicle Body Building work such as Power Hacksaw, Folding, Shearing, Punching, Notching, Pipe bending, Nibbling, Square tube bending, Power press. Press brakes and different types of Drilling machines.
21. Making components and sub-assembly mounted on chassis.
22. Bending body angle, mudguard angle and wheel arch angle or tube.
23. Assembling and body angles and front and rear structure on main frame and welding.
24. Cutting and providing gussets on joints and corners and reinforcing weak areas.
25. Making and fitting sub-assemblies like footsteps, battery box. luggage carrier, brackets, ladder, diesel tank brackets, front and rear structure, bonnet structure and dash board structure.
26. Making jigs and fixture for items like : Handles, Passenger seat frames, Centre posts, Front and Rear structure for different types of bodies, Ladder, Wheel arch, Body arch angle, Body side kit, Assembly fixture, Floor Assembly fixture
27. Balancing entire body structure. Method of mounting the body on chassis with suitability of chassis numbers. (Before taking body construction). Method of checking alignment for the body structure with the help .of lead screw jack levelling of chassis use of hoist.
28. Making fixing and aligning driver door, emergency door and other doors with hinges.
29. Making and fixing drivers cabin frame and partition.
30. Cutting, Pressing, Bending and Forming panels for right/left side, rear, front and roof panels and bumper.
31. Bending door frames and panelling.
32. Forming of glass frames, front cowl, grillwork, routeboard-frames, inner mudguard and hanging mudguards. Windshield and glass panel - beading, gluing & mounting.
33. Fixing ornamental and ordinary headings and aluminium extrusions.
34. Manufacturing of different components such as curtainbox frames, locking arrangements, driver door, wheel arch boxes, battery box, route board, roof pannel, bonnet, front grill, tool box, first aid box and steps etc.
35. Panelling sheets on wooden structure or Tube structure.
36. Final fitments of seat, hand nests glasses, fan, water carrier, brackets and other accessories as per Motor Vehicle Act. Stage inspection and final inspection and Roof leakage testing.
37. Use of power operated machines such as pneumatic drilling riveting and tightening and power hammer and press tools
38. Setting machines for production work. Roof leak test.

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39. Spray Painting (Metallic, Enamel, Wrinkle, Hammer-tone finish) Red Oxide and Etch Primer)
40. Perform TPM (Total Productive Maintenance), TQM (Total Quality Management) and record keeping system.

NOTE:

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



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7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING OUTCOME	
Learning Outcomes	Assessment Criteria
1. Recognize & comply safe working practices, environment regulation and housekeeping.	1.1 Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements.
	1.2 Recognize and report all unsafe situations according to site policy.
	1.3 Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	1.4 Identify, handle and store / dispose off dangerous/unsalvageable goods and substances according to site policy and procedures following safety regulations and requirements.
	1.5 Identify and observe site policies and procedures in regard to illness or accident.
	1.6 Identify safety alarms accurately.
	1.7 Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	1.8 Identify and observe site evacuation procedures according to site policy.
	1.9 Identify Personal Productive Equipment (PPE) and use the same as per related working environment.
	1.10 Identify basic first aid and use them under different circumstances.
	1.11 Identify different fire extinguisher and use the same as per requirement.
	1.12 Identify environmental pollution & contribute to avoidance of same.
	1.13 Take opportunities to use energy and materials in an environmentally friendly manner
	1.14 Avoid waste and dispose waste as per procedure
	1.15 Recognize different components of 5S and apply the same in the working environment.
2. Understand, explain different mathematical calculation & science in the field of study including basic electrical and apply in day to day	2.1 Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat & temperature, force, motion, pressure, heat treatment.
	2.2 Measure dimensions as per drawing

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work.[Different mathematical calculation & science -Work, Power & Energy, Algebra, Geometry & Mensuration, Trigonometry, Heat & Temperature, Levers & Simple machine, Power transmission, Pressure]	2.3 Use scale/ tapes to measure for fitting to specification.
	2.4 Comply given tolerance.
	2.5 Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.
	2.6 Ensure dimensional accuracy of assembly by using different instruments/gauges.
	2.7 Explain basic electricity, insulation & earthing.
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. [Different engineering drawing-Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Rivets.Joints& different thread forms, Assembly drawing, Sectional views, Electrical & electronic symbol]	3. 1. Read & interpret the information on drawings and apply in executing practical work.
	3. 2. Read & analyse the specification to ascertain the material requirement, tools, and machining /assembly/maintenance parameters.
	3. 3. Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.
4. Select and ascertain Marking,Measuring and cutting instrument and marking on components and record data.	4.1 Select appropriate marking,measuring and cutting instruments such asScriber,Divider, Steel.rule,Snip etc...(as per tool list).
	4.2 Ascertain the functionality & correctness of the instrument.
	4.3 Mark on thecomponents,cutto the dimension, measure& record data to analyse the with given drawing/measurement.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	5.1 Explain the concept of productivity and quality tools and apply during execution of job.
	5.2 Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.
	5.3 Knows benefits guaranteed under various acts
6. Explain energy conservation, global warming and pollution and contribute in day to day	6.1 Explain the concept of energy conservation, global warming, pollution and utilize the available recourses optimally & remain sensitive to avoid

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work by optimally using available resources.	environment pollution.
	6.2 Dispose waste following standard procedure.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	7.1 Explain personnel finance and entrepreneurship.
	7.2 Explain role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.
	7.3 Prepare Project report to become an entrepreneur for submission to financial institutions.
8. Plan and organize the work related to the occupation.	8.1 Use documents, drawings and recognize hazards in the work site.
	8.2 Plan workplace/ assembly location with due consideration to operational stipulation
	8.3 Communicate effectively with others and plan project tasks
	8.4 Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same.
SPECIFIC OUTCOME	
Block-I& II (Section:10)	
<i>Assessment Criteria i.e. the standard of performance, for each specific learning outcome mentioned under block – I & block – II(section: 10) must ensure that the trainee achieves well developed skill with clear choice of procedure in familiar context. Assessment criteria should broadly cover the aspect of Planning (Identify, ascertain, estimate etc.); Execution (perform, illustration, demonstration etc. by applying 1) a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information 2) Knowledge of facts, principles, processes, and general concepts, in a field of work or study 3)Desired Mathematical Skillsand some skill of collecting and organizing information, communication) and Checking/ Testing to ensure functionality during the assessment of each outcome.The assessments parameters must also ascertain that the candidate is responsible for own work and learning and some responsibility for other's work and learning.</i>	

BASIC TRAINING (Block – I)**Duration: (03) Three Months**

Week No.	Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
1	1. Induction to safety devices used in shop floor. 2. Identification of Tools and Equipments Induction and use of marking tools. 3. Practice in Reading, Steel Rule, Scribing of straight lines, Bisecting of straight lines (on the sheet metal) using marking tools.	General safety precautions Safety precaution in sheet metal work Introduction of First aid. Safety attitude development of the trainee by educating him to use Personal Protective Equipment (PPE). Response to emergencies eg; power failure, fire, and system failure. Introduction to 5S concept & its application. Fire: - Types, causes and prevention methods. Fire Extinguisher, its types. Metals and Non-Metals and their Characteristics, Types, Sizes and uses of Sheet Metals as per BIS. Use of reference table. Raw material information: CRCA, HRCA & MS Material Terms & definitions in sheet metal work.
2	4. Mark and cut through the straight lines 5. Planishing of Sheet Metal and Practice in drawing simple Geometrical shapes. 6. Practice in marking and cutting of sheets to various angles.	Mark and cut through the straight lines Planishing of Sheet Metal and Practice in drawing simple Geometrical shapes. Practice in marking and cutting of sheets to various angles.
3	7. Practice on cutting with different types of snips. 8. Tin snips (Straight cut, Right cut and Left cut) cutting off inside and outside curve, cutting off notches and cutting off profiles.	Hand tools : mallets, hammer, sheet metal hammers, groovers, riveting tools, screw drivers, wrench and spanners etc. Holding tools & accessories: vices, C clamps, stakes, stakes holder, hollow mandrel, wooden former.
4	9. Riveting practice using various types of rivet heads. 10. Single chain riveted joint. Double chain and Zig- zag, Lap & butt riveted joints.	Rivets and its parts, Selection of Rivet heads. Types of Rivet and their uses. Standard sizes of Rivets and Riveting Tools. Calculation for Riveting allowances (pitch and Lap)
5	11. Simple fitting operations such as Chipping, Hacksawing, Filing, Drilling, Thread forming (Tap and Die).	Hand tools and its importance, steel rule, Try square, chisel and care & maintenance, Classification and types of chisels, files and uses. Hacksaw blade, Hacksaw frame and its types. Drill bits- parts, Types & uses.

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6	12. Hand forging operations such as Cold and Hot bending. Spreading, Upsetting, Drawing, Shouldering, Punching, Drifting, Forge welding and Shrinking.	Simple Forging operations such as Jumping, Bending, Upsetting, Drawing, Shouldering, Punching. Drifting and Shrinking
7	13. Simple heat treatment operations such as Hardening, Tempering, Normalising, Annealing, Casehardening.	Heat treatment of metals. Different processes and their advantages. Hardening, Tempering, Normalising, Annealing and Case hardening
8	14. Soldering, Tinning and Brazing and simple sheet metal operations such as Bending, Rolling, Shaping, Flanging, Edging, Hollowing, reinforcement of sheet metal components.	Soldering and brazing of metals. Types of solder and fluxes. Purposes and use of fluxes.
9	15. Riveting and Riveted joints (Hot and Cold) Practice on riveting by using Pop rivets. Aluminium (solid) Copper Rivet M.S. Rivet. Tubler Rivet and Bifurcated Rivet and its use. • Types of Rivet Guns : • For Solid Rivet. • For Pop Rivet.	Description and uses of non-ferrous metals. Copper, Aluminium, Brass, Zinc, Lead, Tin, Muntzmetal broad principles of manufacturing the above metals.
10	16. Handling of different types of grinding machines such as bench grinder pedestal grinder, hand and Flexible grinder.	Description about different types of Grinding Machines-Bench Grinder, pedestal, hand and Flexible Grinder.
11	17. Simple welding (Gas & Electric) including brazing. Use of 'Spot Welding equipment in Sheet Metal'. Practice on Gas cutting.	Brief description of welding equipment (Gas & Electric) and the processes of welding.
12	18. Marking out as per drawing and cutting off sheet metal by using hand liver shears and Nibbling shears	Different types of sheets used in Body Building protective coats of sheet metal Galvanising. Anodizing, Tinning, Painting etc.
13	Internal Assessment/Examination 03days	

NOTE: -

- *More emphasis to be given on video/real-life pictures during theoretical classes. Some real-life pictures/videos of related industry operations may be shown to the trainees to give a feel of Industry and their future assignment.*

BASIC TRAINING (Block – II)

Duration: (03) Three Months

Week No.	Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
1	19. Use of Common hand tools used in the shop floor such as hammer, chisel, hacksaw, steel rule, dividers, calipers, punches, shears, blow lamp, centre punch, scribe, D.E. spanner, Ring spanner, Torque Wrench for 'IT clamping, screw driver.	Description and use of special tools, used in the Motor Vehicle Body Building Work, such as Panel Pliers, Duck bill snips, Metal shears, Offset screw drivers, Door handle tools, Dolly block of different types, Body panel spoon, Body file holder, Bumping hammer, Roughing hammer, Pneumatic drilling and Riveting attachments.
2	20. Cutting and shearing runner angles, flats and channels to required dimensions. 21. Straightening runner angles, flats and channels both by hand and by machine.	Methods of forming simple parts by hand work and by mechanical press tools and equipment and fittings used in this process.
3	22. Making simple components and sub-assembly related to Motor vehicle body.	Methods of mounting body on the chassis. Problem Solving Tools: Basic 7 Quality Tools.
4-5	23. Bending practice on angles, tube and flat of different sizes and assembling by different welding technique as per drawing to make utility structure like footsteps, battery box, ladder, diesel tank brackets, etc.	Techniques impressing steel body panels door, windows, quarter panel mounting.
6	24. Spot welding, seam welding. 25. Deposit bead on MS sheet in flat position. Lap joint T joint and butt joint in down hand position. 26. TIG welding. Deposit bead on SS sheet in flat position. Making butt, Tee and corner joint.	Various methods of finishing and fixing metal panels to body frame work. Special steels used for pressing in body work. Adhesives used in Motor Vehicle Body Building sealing compound for body joints and trim assembly.
7	27. Gas cutting of sheets. 28. Grinding of tool including drill bits. 29. Identify different power operated machines such as pneumatic drilling, riveting and tightening, power hammer and their operation.	Use of leather cloth carpet, linoleum and glass panels, qualities and grades in common use.
8	30. Pipe bending and flaring of pipe. 31. Joining of pipes & test for leakage. 32. Make by soldering Elbow 90° equal dia pipe T joint 90° equal dia pipe 33. T joint 90° unequal dia pipe by soldering 34. Make by soldering T Pipe 60°branch	Provision of clamps and piping for concealed wiring for wiring hardness for interior lamps, lamp switches, lighter/heater fans, radio, tape recorder, speaker, television, air conditioner and power operated units.

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	joint unequal dia pipe Offset T joint equal dia	
9-10	35. Practice on making driver door, emergency door and other doors with hinges. 36. Making holes in sheet metal using Punching Machine. 37. Making holes in sheets with a twist drill. 38. Practice in Drilling Holes in walls and Ceilings as applied to ducting work.	Brief description arrangements and types of seat frames and back rests, handles, partitions, grill assembly rails, inner grab.
11	39. Practice cutting, pressing, bending and forming to make different utility items.	Repairing of damaged fenders, doors, and frames checking frame, alignment.
12	40. Identify different painting defects and remedies to set right the defects. 41. Practice of Buffing and polishing	Estimation of materials used for construction of Motor Vehicle body, cost of construction and weight on the body.
13	Revision & Internal Assessment	

NOTE: -

- *More emphasis to be given on video/real-life pictures during theoretical classes. Some real-life pictures/videos of related industry operations may be shown to the trainees to give a feel of Industry and their future assignment.*

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9.1 WORKSHOP CALCULATION SCIENCE & ENGINEERING DRAWING

Block – I		
Sl. No.	Workshop Calculation and Science (Duration: - 20 hrs.)	Engineering Drawing (Duration : - 30 hrs.)
1.	Units & Measurements- FPS, CGS, MKS/SI unit, unit of length, Mass and time. Fundamentals and derived units Conversion of units and applied problems.	Engineering Drawing: Introduction and its importance Different types of standards used in engineering drawing. Drawing Instruments: their uses 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.	Material Science : properties -Physical & Mechanical, Types -Ferrous & Non-Ferrous, difference between Ferrous and Non-Ferrous metals	Lines : types and applications in Drawing as per BIS SP:46-2003 Drawing geometrical object using all types of lines. Drawing of Geometrical Figures: Angle, Triangle, Square, Rectangle and Circle. Letters: - Lettering styles, Single stroke letters and numbers as per IS standard. Lettering practice
3.	Mass .Weight and Density : Mass, Unit of Mass, Weight, difference between mass and weight, Density, unit of density,	Dimensioning- Types of dimension, elements of dimensions, Methods of indicating Values, Arrangement, Alignment and indication of dimensions. Scales:-Types use and construction. Representative factor of scale.
4.	Speed and Velocity: Rest and motion, speed, velocity, difference between speed and velocity, acceleration, retardation.	Method of presentation of Engineering Drawing - Pictorial View

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	Average Velocity, Acceleration & Retardation. Related problems. Circular Motion: Relation between circular motion and Linear motion, Centrifugal force, Centripetal force	- Orthogonal View - Isometric view
5.	Ratio & Proportion : Simple calculation on related problems. Percentage: Introduction, Simple calculation.	Constructions: - Draw proportionate free hand sketches of plane figures. Sketch horizontal, vertical and inclined line by free hand, Draw circles by free hand using square and radial line method, Draw arcs and ellipse by free hand
6.	Work, Power and Energy: work, unit of work, power, unit of power, Horse power of engines, mechanical efficiency, energy, use of energy, potential and kinetic energy, examples of potential energy and kinetic energy. Meaning of H.P., I.H.P., B.H.P., and F.H.P. and CC and Torque.	Projections: 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. Free hand Drawing of Orthographic projection from isometric/3D view of geometrical blocks

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Block – II		
Sl. No.	Workshop Calculation and Science (Duration: - 20 hrs.)	Engineering Drawing (Duration : - 30 hrs.)
1.	Algebra: Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).	Screw :- Its Types and Sizes, Screw thread, their standard forms as per BIS, external and internal thread.
2.	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.	Rivets and Joints:- Prepare a drawing sheet on rivets nomenclature and Joints.
3.	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. Volume of cut-out solids: hollow cylinders, frustum of cone, block section. Volume of simple solid blocks.	Free hand Sketches for simple pipe line with general fittings.
4.	Basic Electricity: Introduction, use of electricity, how electricity is produced, Types of current_ AC, DC, their comparison, voltage, resistance, their units. Conductor, insulator, Types of connections - series, parallel, electric power, Horse power, energy, unit of electrical energy. Concept of earthing.	Reading of drawing. Simple exercises related to missing lines, dimensions. How to make queries.
5.	Simple machines Transmission of power: - Transmission of power by belt, pulleys & gear drive. Heat treatment process: - Heat treatment and advantages. Annealing, Normalizing, Hardening, Tempering.	Simple exercises related to trade related symbols. Basic electrical and electronic symbols
6.	Trigonometry: Trigonometrical ratios, measurement of angles. Trigonometric tables. Finding the value of unknown sides and angles of a triangle by Trigonometrical method. Finding height and distance by trigonometry.	Free hand sketch of trade related components / parts /cutting tool indicating angles.

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	Application of trigonometry in shop problems. (viz. taper angle calculation). Calculate the area of triangle by using trigonometry and application of Pythagoras theorem.	
7.	Concept of pressure - Definition:- Force, Pressure, and their units, atmospheric pressure, gauges used for measuring pressure, problems. Introduction to pneumatics & hydraulics systems.	
8.	Simple exercises related to trade related Test Papers. Solution of NCVT test papers.	



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9.2 EMPLOYABILITY SKILLS**(DURATION: - 110 HRS.)**

Block – I (Duration – 55 hrs.)		
1. English Literacy		Duration : 20 Hrs. Marks : 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		Duration : 20 Hrs. Marks : 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	Basic of computer Networks (using real life examples), Definitions of	

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Networking and Internet	Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication. Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes.
3. Communication Skills	
Duration : 15 Hrs. Marks : 07	
Introduction to Communication Skills	Communication and its importance Principles of Effective communication Types of communication - verbal, non verbal, written, email, talking on phone. Non verbal communication -characteristics, components-Para-language Body language Barriers to communication and dealing with barriers. Handling nervousness/ discomfort.
Listening Skills	Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening. Triple- A Listening - Attitude, Attention & Adjustment. Active Listening Skills.
Motivational Training	Characteristics Essential to Achieving Success. The Power of Positive Attitude. Self awareness Importance of Commitment Ethics and Values Ways to Motivate Oneself Personal Goal setting and Employability Planning.
Facing Interviews	Manners, Etiquettes, Dress code for an interview Do's & Don'ts for an interview.
Behavioral Skills	Problem Solving Confidence Building Attitude
Block – II Duration – 55 hrs.	
4. Entrepreneurship Skills	
Duration : 15 Hrs. Marks : 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	
Duration : 10 Hrs. Marks : 05	
Benefits	Personal / Workman - Incentive, Production linked Bonus, Improvement in living standard.
Affecting Factors	Skills, Working Aids, Automation, Environment, Motivation - How improves or slows down.
Comparison with developed countries	Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.
Personal Finance Management	Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.
6. Occupational Safety, Health and Environment Education	
Duration : 15 Hrs. Marks : 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 legislation of India. safety, health, welfare under legislative of India.
Ecosystem	Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.
Pollution	Pollution and pollutants including liquid, gaseous, solid and hazardous waste.
Energy Conservation	Conservation of Energy, re-use and recycle.
Global warming	Global warming, climate change and Ozone layer depletion.
Ground Water	Hydrological cycle, ground and surface water, Conservation and Harvesting of water.
Environment	Right attitude towards environment, Maintenance of in -house environment.
7. Labour Welfare Legislation	
Duration : 05 Hrs. Marks : 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	
Duration : 10 Hrs. Marks : 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 House-keeping, Practice of good Housekeeping.
Quality Tools	Basic quality tools with a few examples.

10. DETAILS OF COMPETENCIES (ON-JOB TRAINING)

Broad Learning To Be Covered In Industry For Motor Vehicle Body Builder Trade:

The **competencies/specific outcomes** on completion of On-Job Training are detailed below: -

Block – I

1. Safety and best practices/Basic Industrial Culture (5S, KAIZEN, etc.)
2. Prepare different types of documentation as per industrial need by different methods of recording information.
3. Use of Common hand tools used in the shop floor such as hammer, chisel, hacksaw, steel rule, dividers, calipers, punches, shears, blow lamp, protractor, vernier, centre punch, scribe, D.E. spanner, Ring spanner, Torque Wrench for 'IT clamping, screw driver. Bench vice. Grinding Machine and Box spanner-special types of fabrication spanners to suit the assembly conditions.
4. Marking on Sheet Metal, Shearing, Bending, Notching, Punching for pillars, Waist rail etc. Explain the body structure parts and materials.
5. Handling of different types of grinding machines such as modified Angular. Automatic and Flexible.
6. Lighting and maintenance of forge by manual and power.
7. Simple forging operations such as Hammering Square, round, Flat, Hexagon, Octagon, Tapered sections and Jumping.
8. Hand forging operations such as Cold and Hot bending. Spreading, Upsetting, Drawing, Shouldering, Punching, Drifting, Forge welding and Shrinking.
9. Grinding of forged articles and hand tools including drill bits.
10. Simple heat treatment operations such as Hammering, Tempering, Normalising, Annealing, Casehardening. Recambering process of leaf springs and pre-treatment of phosphating (in cold and hot process) Galvanizing and Sheradizing process.
11. Riveting and Riveted joints (Hot and Cold) Practice on riveting by using Pop rivets. Aluminium (solid) Copper Rivet M.S. Rivet. Tubler Rivet and Bifurcated Rivet and its use.
12. Simple welding (Gas & Electric) including brazing. Use of 'Spot Welding equipment in Sheet Metal'. Practice on Gas cutting Gas cutting of sheets. Tig and Mig welding. Practice on Arc Welding types such as: (1) Vertical downward, (2) Vertical upward, (3) Horizontal welding positions and cutting practice. Types of Electrodes, checking of good quality electrodes, cutting rods and metal sprays.
13. Marking out as per drawing and cutting off sheet metal by using hand lever shears and Nibbling shears.
14. Soldering, Tinning and Brazing and simple sheet metal operations such as Bending, Rolling, Shaping, Flanging, Edging, Hollowing, reinforcement of sheet metal components.
15. Allied forming and cutting operations such as Folding Flaring and Trepanning.

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16. Annealing of copper, Cutting, Bending and Soldering of copper tubes.
17. Use of hand operated machines such as Guillotine shearing Machine. Grooving M/C, Folding M/C, Turning M/C, Wiring M/C, Beading M/C, Circle cutting M/C, Pillar type drilling M/C, Fly press Nibbling M/C, Flat cutting M/C with channels and angles and practice in bending square-tube and hat sections for roof stick and side pillar manually and pneumatically.
18. Introduction of F.R.P. materials and method of fabricating of components and its salient feature.

BLOCK – II

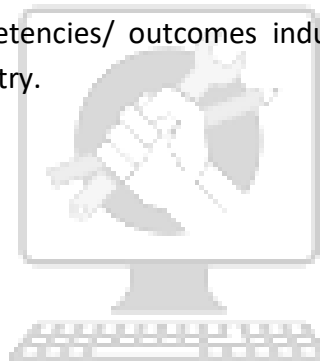
19. Instructions in Safety precautions on the Shop Floor and Environmental standards.
20. Practice in use of machines utilized in Motor Vehicle Body Building work such as Power Hacksaw, Folding, Shearing, Punching, Notching, Pipe bending, Nibbling, Square tube bending, Power press. Press brakes and different types of Drilling machines.
21. Making components and sub-assembly mounted on chassis.
22. Bending body angle, mudguard angle and wheel arch angle or tube.
23. Assembling and body angles and front and rear structure on main frame and welding.
24. Cutting and providing gussets on joints and corners and reinforcing weak areas.
25. Making and fitting sub-assemblies like footsteps, battery box. luggage carrier, brackets, ladder, diesel tank brackets, front and rear structure, bonnet structure and dash board structure.
26. Making jigs and fixture for items like : Handles, Passenger seat frames, Centre posts, Front and Rear structure for different types of bodies, Ladder, Wheel arch, Body arch angle, Body side kit, Assembly fixture, Floor Assembly fixture
27. Balancing entire body structure. Method of mounting the body on chassis with suitability of chassis numbers. (Before taking body construction). Method of checking alignment for the body structure with the help .of lead screw jack levelling of chassis use of hoist.
28. Making fixing and aligning driver door, emergency door and other doors with hinges.
29. Making and fixing drivers cabin frame and partition.
30. Cutting, Pressing, Bending and Forming panels for right/left side, rear, front and roof panels and bumper.
31. Bending door frames and panelling.
32. Forming of glass frames, front cowl, grillwork, routeboard-frames, inner mudguard and hanging mudguards. Windshield and glass panel - beading, gluing & mounting.
33. Fixing ornamental and ordinary headings and aluminium extrusions.
34. Manufacturing of different components such as curtainbox frames, locking arrangements, driver door, wheel arch boxes, battery box, route board, roof pannel, bonnet, front grill, tool box, first aid box and steps etc.
35. Panelling sheets on wooden structure or Tube structure.

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36. Final fitments of seat, hand nests glasses, fan, water carrier, brackets and other accessories as per Motor Vehicle Act. Stage inspection and final inspection and Roof leakage testing.
37. Use of power operated machines such as pneumatic drilling riveting and tightening and power hammer and press tools
38. Setting machines for production work. Roof leak test.
39. Spray Painting (Metallic, Enamel, Wrinkle, Hammer-tone finish) Red Oxide and Etch Primer)
40. Perform TPM (Total Productive Maintenance), TQM (Total Quality Management) and record keeping system.

Note:

- Industry must ensure that above mentioned competencies are achieved by the trainees during their on job training.
- In addition to above competencies/ outcomes industry may impart additional training relevant to the specific industry.



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INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

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LIST OF TOOLS AND EQUIPMENT for Basic Training (For 20 Apprentices)			
Sl. no.	Name of the Tool & Equipments	Specification	Quantity
A. TRAINEES TOOL KIT (For each additional unit trainees tool kit Sl. 1-12 is required additionally)			
1.	Steel Rule	300 mm	20 Nos
2.	Wing Divider	200 mm	20 Nos
3.	Centre Punch	100 mm	20 Nos
4.	Spring Dividers	150 mm	20 Nos
5.	Ordinary Wooden Mallet		20 Nos
6.	Soldering Copper Hatchet Type	0.25 kg	20 Nos
7.	Cross Peen Hammer with handle	0.25 kg	20 Nos
8.	Protractor with blade	150mm	20 Nos
9.	Steel tape	2 metres	20 Nos
10.	Ballpene hammer	0.5kg with handle	20 Nos
11.	Scriber	150 mm x 3 mm (Engineer's)	20 Nos
12.	Prick punch	100mm	20 Nos
B : INSTRUMENTS & GENERAL SHOP OUTFIT			
13.	Steel Square	450 mm x 600 mm	4 Nos.
14.	Sheet Metal Gauge		1 No
15.	Hatcher Stake		4 Nos.
16.	Stake Round and Bottom		4 Nos.
17.	Half Moon Stake		4 Nos.
18.	Funnel Stake		4 Nos.
19.	Anvil Face Stake		4 Nos.
20.	Bick Iron Stake		4 Nos.
21.	Tinman's Horse		2 Nos.
22.	Hammer Peaning with handle		4 Nos.
23.	Hammer Creasing with handle		4 Nos.
24.	Hammer Planishing with handle		4 Nos.
25.	Hammer Block with handle		2 Nos.
26.	Shear Tinman	300mm	8 Nos
27.	Snip straight		8 Nos
28.	Right cut snips	250mm	4 Nos

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29.	Left cut snips	250mm	4 Nos
30.	Hand Shear Universal	250 mmID	4 Nos.
31.	Hollow Punch set Round	3 mm Dia	2 Nos.
32.	Rivet sets snap and Dolly combined 3 mm		4 Nos.
33.	Chisel cold flat	25 mm x 250 mm .	4 Nos
34.	Punch Letter	4 mm	1 set
35.	Punch Number	4 mm	1 set
36.	File flat second cut	250 mm	2 Nos.
37.	File flat smooth	250 mm	2 Nos.
38.	File flat bastard	300 mm	2 Nos.
39.	File half round smooth	300 mm	2 Nos.
40.	Hacksaw frame adjustable (Tubular)	300 mm	4 Nos.
41.	Hand Groover	5 mm	4 Nos.
42.	Plier.Combination	150 mm	2 Nos.
43.	Grip Wrench I D	200 m m	2 .Nos.
44.	Ladle.	150 mm Dia	2 Nos
45.	Blow Lamp	1 litre.	2 Nos
46.	H.S.S. Twist Drill each (parallel Shank)	3 mm, 4 mm & 6 mm	3 Nos.
47.	Hand Drill machine	0 to 12 mm	2 Nos.
48.	Soldering Copper Hatchet type	500 gms.	8 Nos
49.	Pneumatic rivet gun		2 Nos.
50.	Trammel Point	with beam 600 mm	1 No.
51.	Vernier caliper	0 mm - 150 rom	1 No
52.	Micrometer Outside	0 to 25 mm	1 No.
53.	File Rasp cut	250 mm	2 Nos.
54.	D.E. Spanner G.P.	(6 mm to 32 mm) (Set of 12 spanner)	2 Set
55.	Bossing Mallet		4 Nos
56.	End tacked Mallet		4 Nos
57.	Soft hammer (Brass, copper, Lead)		4 Nos
58.	Steel Rule	600mm	4 Nos
59.	Oilcan pressure feed	500ml	2Nos
60.	Raising hammer with handle		4 Nos
61.	Rawl Punch holder and bits	No.8, 10, 12, 14	2 . Sets
62.	Hollowing Hammer with handle		4 Nos.
63.	Tripaning tool	70 mm	1 No.

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64.	Hand vice	50 mm	4 Nos.
65.	Tongs Flat		2 Pairs.
66.	Portable Electric drill (Single phase)	6mm	2 Nos
67.	Pop rivet gun		2 Nos.
68.	Lazy Tong		2 Nos.
69.	Screw Driver	250 mm	2 Nos.
70.	Round File 2nd Cut	250 mm	4 Nos.
71.	Triangular File 'Smooth	250 mm	4 Nos.
72.	Square File 2nd Cut	250 mm.	4 Nos.
73.	Needle File (Swiss File)	150 mm	1 set
74.	C Clamp	150 mm	2 Nos.
C : GENERAL MACHINERY INSTALLATIONS			
75.	Bench leaver shears m Capacity	250 mm Blade x 3m	1 No.
76.	Air Compressor (Pressure and displacement of air) Pneumatic Pop rivet Gun		1 . No
77.	Spray Gun(painting)	500 ml.	1 No.
78.	Combination turning up and wiring machine		1 No.
79.	Guillotine. Shearing Machine foot operated		1 No.
80.	Oxy acetylene welding plant (complete set)		1 set
81.	Circle cutting machine	300 mm dia	1 set
82.	Pillar type drilling machine	12 mm	1 No.
83.	Slip roll former	1.6. mm x 1000 mm	1 No.
84.	D.E. Grinder Pedestal motorised	200 mm	1 No.
85.	Anvil	50 kgs with Stand	1 No.
86.	Bench vice	120 mm, 150 mm	2 each
87.	Fly press Ball press No.4 single body		1 No.
88.	Power Press	2 Tons	1 No.
89.	Buffing and Polishing Machine		1 No.
90.	Nibbling Machine		1 No.
91.	Spinning Lathe		1 No.
92.	Seaming Machine .		1 No.
93.	Glass cutter - Diamond point		1 No.
94.	Work Bench	1820 x 1310 x 760 mm	4 Nos.
95.	Almirah	1820 x 1210 x 450 mm	2 Nos.

MOTOR VEHICLE BODY BUILDER

96.	Metal rack	1820 x-1520 x 450 mm	2 Nos.
97.	Steel Lockers	with 8 Drawers .	2 Nos.
98.	Fire extinguisher Soda Acid and foam type		1 each
99.	Fire buckets with Stand-		4, Nos.
100.	Black Board with Easel .		1 No.
101.	Wooden Stool	450.mm.	1 No.
102.	Portable Nibbler		2 Nos.
103.	Portable Pneumatic Shear.		2 Nos.
104.	Pipe Bending Machine (Hydraulic Type)	12 mm to 30 mm	1 No.
105.	Hand Press Brake Capacity	(0.8 mm)	1 No.
106.	Beading Machine)	with 380 mm throat clearance (with crimping rollers	1 No.
107.	Tin .smiths bench folder	600 x 1.6 mm	1 No.
108.	Gas Welding Table	1220 mm x 760 mm	1 No.
109.	Spot Welding Machine		1 No.
110.	Arc welding Transformer/ Rectifier/Inverter 300Amps with accessories		1 set
111.	Co ₂ welding machine complete set	300Amps	1 set
112.	TIG welding machine complete set	200 Amps	1 set
113.	Universal cutting machine		1 No.

Note:

- In case of basic training setup by the industry the tools, equipment and machinery available in the industry may also be used for imparting basic training

MOTOR VEHICLE BODY BUILDER

INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND ENGINEERING DRAWING

TRADE: MOTOR VEHICLE BODY BUILDER LIST OF TOOLS& EQUIPMENTS FOR -20APPRENTICES

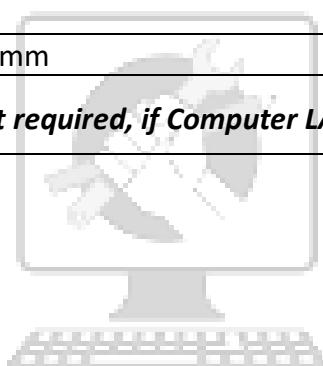
1) Space Norms : 45 Sq.m.(For Engineering Drawing)

2) Infrastructure:

A : TRAINEES TOOL KIT:-			
Sl. No.	Name of the items	Specification	Quantity
1.	Draughtsman drawing instrument box		20+1 set
2.	Set square celluloid 45°	(250 X 1.5 mm)	20+1 set
3.	Set square celluloid 30°-60°	(250 X 1.5 mm)	20+1 set
4.	Mini drafter		20+1 set
5.	Drawing board	(700mm x500 mm) IS: 1444	20+1 set
B : Furniture Required			
Sl. No.	Name of the items	Specification	Quantity
1	Drawing Board		20
2	Models : Solid & cut section		as required
3	Drawing Table for trainees		as required
4	Stool for trainees		as required
5	Cupboard (big)		as required
6	White Board	(size: 8ft. x 4ft.)	as required
7	Trainer's Table		as required
8	Trainer's Chair		as required

MOTOR VEHICLE BODY BUILDER

TOOLS & EQUIPMENTS 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.		



Skill India
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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 :			Semester:			Duration of the Trade/course:								
Learning Outcome:														
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														