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

COMPETENCY BASED CURRICULUM

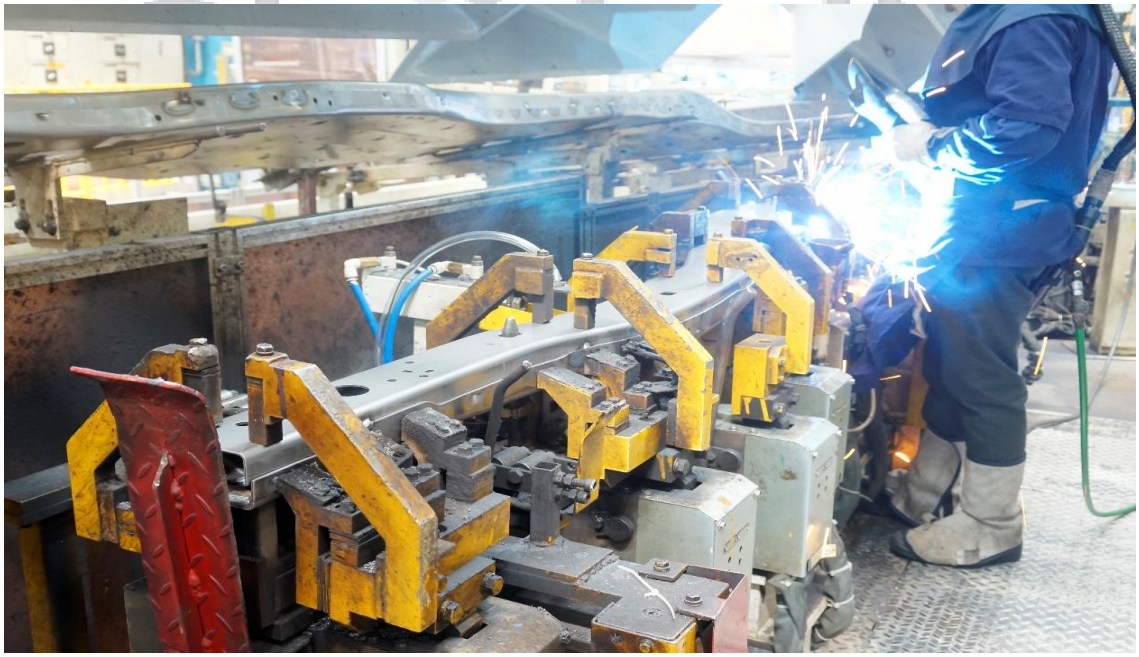
AUTOMOTIVE WELD TECHNICIAN

(Duration: Two Years)

CRAFTSMEN TRAINING SCHEME (CTS)

(Flexi MoU)

NSQF LEVEL- 4



SECTOR –AUTOMOTIVE

AUTOMOTIVE WELD TECHNICIAN

(Engineering Trade)

(Designed in 2022)

Version: 1.0

CRAFTSMEN TRAINING SCHEME (CTS)

(Flexi MoU)

NSQF LEVEL - 4

Developed By

Ministry of Skill Development and Entrepreneurship

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1. COURSE INFORMATION

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

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

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

FIRST YEAR – In the first year, the contents covered are safety aspects covers components like OSH&E, PPE, Fire extinguisher, First Aid and in addition 5S of Kaizen is being taught related to trade.

In the first year, the contents covered are safety aspects related to trade, familiarization with institute/Industry, course type of work, rules & regulation in trade, recognize & comply with occupational safety & Health rules, & environmental practices, Measuring & Marking tools, Quality concept of car body, Grinding operation using powered tools, trace & test all electrical components & circuits, Car shell body quality concepts. The trainee will also be able to understand & perform pre-operation check & safety aspects during Car shell body.

SECOND YEAR –In this year Trainee will learn to perform welding technics using different types of welding methods like Gas welding & Cutting operation by using oxy acetylene gas on different MS plate both theory & practical knowledge, SMAW, GMAW, GTAW, resistance-spot welding, Job surface preparation like removing of foreign particles, scaling & rust by emery or sand paper & preparation of different types of joints – Fillet (T-joint, lap, corner), Butt (square & V); various positions – 1F,1G The trainee will also learn about welding defects, causes of defects, weld defects trouble shooting & final detailing of repairing of weld defect. The trainee also learns about Toyota production system in detail.

2. TRAINING SYSTEM

2.1 GENERAL

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

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

Broadly candidates need to demonstrate that they are able to:

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

2.2 PROGRESSION PATHWAYS

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

2.3 COURSE STRUCTURE

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

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

2.4 ASSESSMENT & CERTIFICATION

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

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

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

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

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

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

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

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

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

The trainee will be tested for his skill, knowledge and attitude during the period of the course and at the end of the training program as notified by the Government of India (GoI) from time to time. The employability skills will be tested in the first year itself.

The **Internal Assessment** during the period of training will be done by **Formative Assessment Method** by testing for assessment criteria listed against learning outcomes. The training institute must maintain an individual trainee portfolio as detailed in assessment guideline. The marks of internal assessment will be as per the template (Annexure –II).

The learning outcome and assessment criteria will be the basis for setting question papers for final assessment. The examiner during final examination will also check the individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

The minimum pass percentage for practical is 60% & minimum pass percentage of theory subjects is 33%.

2.4.2 ASSESSMENT GUIDELINE

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

Assessment will be evidence based comprising the following:

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

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

Performance Level	Evidence
(a) Weightage in the range of 60%-75% to be allotted during assessment	

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

3. JOB ROLE

Welder while doing Gas welding; Fuses metal parts together using welding rod and oxygen-acetylene flame. Examines parts to be welded, cleans portion to be joined, holds them together by some suitable device and if necessary, makes narrow groove to direct flow of molten metal to strengthen joint. Selects correct type and size of welding rod, nozzle etc. and tests welding, torch. Wears dark glasses and other protective devices while welding. Releases and regulates valves of oxygen and acetylene cylinders to control their flow into torch. Ignites torch and regulates flame gradually. Guides flame along joint and heat it to melting point, simultaneously melting welding rod and spreading molten metal along joint shape, size etc. and rectifies defects if any.

Welder while doing Arc welding; fuses metals using arc-welding power source and electrodes. Examines parts to be welded, cleans them, and sets joints together with clamps or any other device. Starts welding power source and regulates current according to material and thickness of welding. Connect one lead to part to be welded, selects required type of electrode and clamps other lead to electrode holder. May join parts first at various points for holding at specified angles, shape, form, and dimension by tack welding. Establish arc between electrode and joint and maintain it throughout the length of the joint.

Welder while doing Gas cutting; cuts metal to require shape and size by gas flame either manually or by machine. Examines material to be cut and marks it according to instruction of specification. Makes necessary connections and fits required size of nozzle in welding torch. Releases and regulates flow of gas in nozzle, ignites and adjusts flame. Guides flame by hand or machine along cutting line at required speed and cuts metal to required size.

Welder while doing Gas brazing; Joints metal parts by heating using flux and filler rods. Cleans and fastens parts to be joined face to face by wire brush. Apply flux on the joint and heats by torch to melt filler rods into joint. Allows it to cool down. Clean and examines the joint.

Welder, Resistance; Sets up and operates resistance welding machine to join metal parts, according to blueprints, work orders, or oral instructions. Turns machine dials to set air and hydraulic pressure, amperage, and joining time, according to specified type of metal, weld, and assembly. May select, install, and adjust electrodes. Aligns work pieces, using square and rule. May hold pieces together manually, fasten into jigs, or secure with clamps to align in specified assembly position. Holds part between electrodes or positions on machine worktable. Depresses pedal or pulls trigger to close electrodes and form weld at point of contact. Releases pedal or trigger after specified welding time. Cleans electrodes, using file, tip dresser, emery cloth. May operate machine which automatically releases electrodes from metal after welding cycle. May devise and build fixtures to hold pieces. May inspect finished work. May operate machine equipped with two or more electrodes which weld at several points simultaneously.

Important variations include types of joints welded (seam, spot, butt) and types of materials welded (steel).

Welder while doing Gas Tungsten Arc welding also known as Tungsten Inert Gas (TIG) welding reads fabrication drawing, examines parts to be welded, cleans them and sets jointswith clamps or any other suitable device. Selects suitable tungsten electrode, grinds the edges,and fit in to the GTA welding torch. Selects gas nozzle and fit in to the GTA welding torch.Selects suitable filler rods and cleans them. Connects work piece with earth cable, Connectsthe machine with Inert gas Cylinder, regulator, and flow meter. Starts the Constant current GTAwelding machine sets suitable welding current & polarity and inert gas flow.

Welder while doing Gas Metal Arc welding also known as MIG/MAG Welding; reads fabrication drawing, examines parts to be welded, cleans them, and sets joints with clamps or any other suitable device. Connects work piece with earth cable. Connects the machine with suitable gas Cylinder, regulator, and flow meter. Connects pre-heater when CO2 is used as shielding gas. Selects suitable wire electrode, feed it to welding GMA Welding torch through wire feeder. Selects contact tip gas nozzle and fit in to the GMA welding torch. Preheats joints as required. Starts the Constant Voltage GMA welding machine, sets suitable welding voltage & wire feed speed and shielding gas flow, produces arc between work piece a continuously fed wire electrode. Melts the metal and deposit weld beads on the surface of metals or joins metal pieces such as Steel, and Stainless-steel metals.

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

Reference NCO-2015:

a) 7212.0100- Welder, Gas
b) 7212.0200- Welder, Electric
c) 7212.0700- Welder, Resistance
d) 7212.0400- Gas Cutter
e) 7212.0500-Brazer
f) 7212.0105- Tungsten Inert Gas Welder
g) 7212.0303 -Gas Metal Arc Welder/Metal Inert Gas/Metal Active Gas/Gas MetalWelder (MIG/MAG/GMAW)
h) 7212.0111- Repair Welder

4. GENERAL INFORMATION

Name of the Trade	**Automotive Weld Technician**
Course Code	DGT/7026
NCO – 2015	7233.0100, 7233.0101, 7412.0101, 7412.0201, 7411.0100, 7421.0300
NSQF Level	Level 4
Duration of Craftsmen Training	Two Years
Entry Qualification	Pass in 10th Examination or its Equivalent
Minimum Age	20
Unit Strength (No. Of Student)	192 Sq. m.
Space Norms	17 KW
Power Norms	64 Sq. m.
Instructors Qualification for	
1. Automotive WeldTechnician	Degree in Mechanical or Electrical orElectronicsand communication or instrumentation orAutomobile Engineering from recognized Engineering College/university with one-year experience in the relevant field. **OR** Diploma in Mechanical or Electrical or Electronics and Communication or instrumentation or Automobile Engineering from recognized board of technical education with two years' experience in the relevant field. **OR** NTC/NAC in the Trade of "**Automotive Weld Technician**" With 3 years' post- qualification experience in the relevant field. **Essential Qualification:** Craft Instructor Certificate in relevant trade under NCVT. Out of two Instructors required for the unit of 2(1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications.
2. Workshop Calculation & Science	B Degree in Engineering with one-year experience. OR Diploma in Engineering with two years' experience. **Essential Qualification:**

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

5. NSQF LEVEL COMPLIANCE

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

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

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

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

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

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

The NSQF Level-4 descriptor is given below:

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

6. LEARNING OUTCOME

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

6.1 GENERIC LEARNING OUTCOME

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

6.2 SPECIFIC LEARNING OUTCOME

FIRST YEAR

10. Recognize & comply with general safe working practices, environment regulation & housekeeping. Industry Orientation
11. Perform measuring & marking by using various measuring & marking tools like Vernier calliper, Micrometre, Files, Scriber, Drill bit, & Grinding tools.
12. Identify & Understand the Electricity terminology.
13. Apply Gas welding & Equipment's operation procedure with quality.
14. Perform Gas cutting, Safety & Equipment's operation procedure with quality, defect causes & remedies.

15. Interpret and apply SMAW Principle and methods, understand Advantages & Disadvantages.
16. Select & apply SMAW Equipment's with procedure with quality standard, Position & Joints, defect causes & remedies.
17. Interpret and apply GMAW Principle and methods, understand Advantages & Disadvantages.
18. Select & applyGMAW Equipment's with procedure with quality standard, Position & Joints, defect causes & remedies.

SECOND YEAR

19. Interpret and apply GTAW Principle and methods, understand Advantages & Disadvantages.Select & applyGTAW Equipment's with procedure with quality standard, Position & Joints, defect causes & remedies.
20. Apply Brazing Principle, Brazing methods & equipment's with procedure with quality standard, defect causes & remedies.
21. Demonstrate Resistance welding, types, methods & equipment's with procedure.
22. Perform Spot welding, Equipment,Accessories, Power source procedure.
23. Plan and performCarUnder body Part joining by using Jigs & Fixtures.
24. Plan and perform Car Shell body Part joining by using Jigs & Fixtures.
25. Maintain Quality standards in Car body Welding, PanelSurface, Door Fitting.
26. Maintain Non defective condition to achieve customer satisfaction.

7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERAL LEARNING OUTCOMES		
LEARNING OUTCOMES		**ASSESSMENT CRITERIA**
1. Identify &comply with general safe working practices, environment regulation and housekeeping & Industry orientation.	1.1	Follow and maintain procedures to achieve safe working environment inlinewithoccupational health andsafetyregulations andrequirements
	1.2	Recognizeandreportallunsafe situations/conditionsaccordingto workplace policy.
	1.3	Identify and take necessaryprecautions onfire and safetyhazardsander portaccordingtoworkplacepolicyand procedures.
	1.4	Identifydifferentfireextinguisherandusethesameas perrequirement.
	1.5	Identify& observe safetyalarms accurately& Evacuation procedures according to workplace policy.
	1.6	Identify andobserve workplacepolicies andprocedures in regardtoillnessoraccident.
	1.7	Reportsupervisor/competentauthorityintheeventof accident orsicknessofanystaffandrecordaccident detailscorrectly according to workplaceaccident/injury procedures.
	1.8	Identifybasicfirstaidandusethemunderdifferent circumstances.
	1.9	IdentifyPersonalProductiveEquipment(PPE)anduse thesameasperrelatedworkingenvironment.
	1.10	Identify environmental pollution and contribute to avoidanceof same.
	1.11	Takeopportunitiestouseenergyandmaterials inan environmentallyfriendlymanner.
	1.12	Identify, handleand store/ dispose of dangerous/unsalvageable goodsandsubstances accordingto workplace policyand dispose waste as per proceduresfollowing safety regulationsandrequirements.
	1.13	Recognizedifferentcomponentsof5Sandapplythe samein theworkingenvironment.
2. Explain&performdifferent mathematiccalculation&science inthefieldofstudy includingbasicelectrical/ Mechanical.*[Different mathematical calculation&science– Arthematics,*	2.1	Solve the basic mathematical calculations related to statistics, Geometry & mensuration accurately
	2.2	Read & Interpret the given drawing and calculate the unknown terms
	2.3	Measuredimensionsasperdrawing & use of appropriate tools
	2.4	Ensure dimensional accuracy of parts/objects by using different instruments/gauges.
	2.5	Explainconceptofbasicsciencerelatedtothefieldsuch as Material science, Mass, weight, density, speed,

graph,Statistics,Algebra, Geometry & Mensuration, Trigonometry, Work,Power & Energy,Heat&Temperature, Levers&Simple machine,Centreofgravity,Powertransmission,Pressure]		velocity,heat&temperature, force,motion,pressure, heattreatment,centerofgravity,friction& solve the problems related to it .
	2.6	Explain basic Electricity, Insulation, earthing & electrical devices OR Explain the basic concepts of drilling, milling, grinding
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Machined components & different thread forms, Assembly drawing, Sectionalviews, Estimation of material]*	3.1	Read & interpret the information on drawings and apply in executing practical work.
	3.2	Read & analyze the specification to ascertain the material requirement,tools,andmachining/assembly/ maintenance parameters & dimensions.
	3.3	Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.
	3.4	Practice & use ISOCPEUR (Engineering script) in day to day writing activities
	3.5	Analyze and draw the drawings from Isometric to orthographic projection & vice versa
	3.6	Practice & draw the free hand sketches related to their trade tools.
4. Select and ascertain measuring instrument and measure dimension of components and record data	4.1	Selectappropriatemeasuringinstrumentssuchas micrometers,Vernier calipers and height gauge(as per toollist).
	4.2	Ascertainthefunctionality&correctness oftheinstrument.
	4.3	Measure dimension of the components & record data to analyses with the given drawing/measurement.
5. Explainentrepreneurshipand manage/organizerelatedtaskindayto dayworkforpersonal&societal growth	5.1	Explain the need & scope of entrepreneurship.
	5.2	Explain role of various schemes and institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financing support agencies to familiarize with the Policies/Programmes, procedure and the available scheme.
	5.3	Explain the concept of SWOT analysis & risk management
	5.4	Explain and understand the qualities of entrepreneurship
6. Explainthe concept inproductivity,qualitytools , andlabourwelfarelegislationandapply suchin daytodayworkto improveproductivity&quality.	6.1	Explain the concept of productivity, quality tools & its necessity and apply during execution of job
	6.2	Explain the concept how to enhance the productivity through working aids, automation etc. at workplace
	6.3	Explain the concept of comparative productivity in the development of countries
	6.4	Understand the basic conceptoflabourwelfare legislation and adhere to responsibilities andremainsensitive towards such laws.

	6.5	Knows benefits guaranteed under various acts.
7. Explain occupational health, energyconservation,globalwarmingandpollutionandcontributeindaytodayworkbyoptimallyusingavailableresources.	7.1	Explain the concept of occupational hygiene, first aid, accident preventions technique at workplace.
	7.2	Explain the concept of energy conservation, global warming, and pollution and utilize the available resources optimally & remain sensitive to avoid environment pollution.
	7.3	Dispose waste following standard procedure.
8. Explain & perform basic computer skills and TPS in day to day work to improve the productivity & quality	8.1	Recognize the parts of computer & its functions and how to apply in day to day usage
	8.2	Explain about the operating systems & management of files in windows [new versions] – Excel, Word & Power point
	8.3	Create & format the word documents as per the requirements
	8.4	Create a worksheet, apply simple formulae & graphs
	8.5	Explain the concept of computer network in daily life [LAN,WAN]
	8.6	Explain the concept of TPS and apply in executing practical work/ workplace.
9. Planandorganizetheworkrelatedtotheoccupation.	9.1	Use documents, drawings and recognize hazards in thework site.
	9.2	Plan workplace/assembly location with dueconsideration to operational stipulation.
	9.3	Communicate effectively with others and plan projecttasks.
	9.4	Assign roles and responsibilities of the co-trainees forexecution of the task effectively and monitor the same.

SPECIFIC LEARNING OUTCOMES	
LEARNING OUTCOMES	**ASSESSMENT CRITERIA**
FIRST YEAR	
10.Recognize & comply with general safe working practices, environment regulation housekeeping. Industry Orientation	10.1 Understand course, general rules pertaining to institute & industry, available facilities, and timetable. Recognize & explain machinery used in trade. Identify type of work to be done during the course.
	10.2 Identify importance of Safety and general Precautions to be observed in the shop. Basic first aid, safety signs – for danger, Warning, caution & personal safety message.
	10.3 Recognize Safe handling of Fuel Spillage, Fire extinguishers used for Different types of fire.
	10.4 Identify First-Aid, nature and causes of injury and utilization of first aid.
	10.5 Recognize Energy saving Tips/Audit of institute/body shop electricity Usage.
	10.6 Perform Hazard identification, dust, thinner & paint (chemical) hazard etc. and countermeasure to eliminate them & usage of specified PPEs.
11. Perform measuring & marking by using various measuring & marking tools like Vernier calliper, Micrometre, Files, Scriber, Drill bit, & Grinding tools.	11.1 Check zero error of instruments and adjust to zero.
	11.2 Select, care, and use of measuring instrument.
	11.3 Measuring engine components with Vernier caliper, Micrometer.
12.Identify & Understand the Electricity terminology.	12.1 Identify the different components used in Electrical device with safe manner
	12.2 Understand the terminology of Amperes, voltage, resistor, diode AC current & DC current, Open circuit voltage, etc.
	12.3 Prepare wire connections by joining wires using solder gun
	12.4 Construct simple electrical circuits and measuring of current voltage and resistance.
13. Apply Gas welding & Equipment's operation procedure with quality.	13.1 Identify the different color code used in gas cylinder & purpose.
	13.2 Explain safety measure points while using gas cylinder & equipment.
	13.3 Identify & explain the different safety device used to protect the gas cylinder like Sigle stage regulator, Double stage regulator, Flash back arrestor.
	13.4 Know the Do's & Don'ts of Hazardous in cylinder like Acetylene, Oxygen.

	13.5 Prepare, set, and tack the pieces as per drawing.
	13.6 Set up the tacked joint in specific position
	13.7 Deposit the weld following proper welding.
	13.8 Carry out visual inspection to ascertain quality weld joint.
14. Perform Gas cutting, Safety & Equipment's operation procedure with quality, defect causes & remedies.	14.1 Identify & Do pre-operation check for gas cutting equipment&purpose.
	14.2 Explain safety measure points while using gas cylinder.
	14.3 Identify & explain the different safety device used to protect the gas cylinder like Sigle stage regulator, Double stage regulator, Flash back arrestor.
	14.4 Know the Do's & Don'ts of Hazardous in cylinder like Acetylene, Oxygen.
	14.5 Plan and select the nozzle size, working pressure, type of flameas per requirement.
	14.6 Plan and mark on MS plate surface for straight/bevel/circular cutting.
	14.7 Select the nozzle size and working pressure of gases as per requirement.
	14.8 Set the marked plate properly on cutting table.
	14.9 Set the cutting plant & perform the cutting operation maintaining proper techniques and all safety aspects.
	14.10 Clean the cutting burrs and inspect the cut surface for soundness of cutting.
15. Interpret and apply SMAW Principle and methods, understand Advantages & Disadvantages.	15.1 Understand about Working principle of arc generation
	15.2 Understand the purpose of coating electrode used in welding.
	15.3 Understand the Metal transfer from electrode & its importance.
	15.4 Understand the application of welding.
	15.5Understand advantages & disadvantages of welding.
16. Select & apply SMAW Equipment's with procedure with quality standard, Position & Joints, defect causes & remedies.	16.1 Plan and select the type & size of electrode, welding current.
	16.2 Prepare edge as per requirement
	16.3 Prepare, set SMAW machine, and tack the pieces as per drawing.
	16.4 Set up the tacked pieces in specific position.
	16.5 Deposit the weld maintaining appropriate arc length, electrode angle, welding speed, weaving technique and safety aspects.
	16.6 Insect the welded joint visually for root penetration, uniformity of bead and surface defects.
	16.7 Inspect the welded joint visually for poor penetration, uniformity of bead and surface defects.
17. Interpret and apply GMAW Principle and methods, understand Advantages & Disadvantages.	17.1 Understand about Working principle of arc generation
	17.2 Understand the purpose MIG & MAG in welding.
	17.3 Understand theDifferent mode of metal transfer.
	17.4 Understand the application of welding.
	17.5 Understand advantages & disadvantages of welding.
18. Select & apply GMAW Equipment's with procedure with quality standard,	18.1 Select size of electrode wire, welding voltage, gas flow rate.
	18.2 Prepare, set (machine & Job) and tack the pieces as per drawing and type of joints.

Position & Joints, defect causes & remedies.	18.3 Set up the tacked joint in specific position.
	18.4 Trouble shoot the blocked contact TIP of torch.
	18.5 Deposit the weld adapting proper welding technique & safety aspects.
	18.6 Carry out visual inspection to ensure quality of weld joint.
SPECIFIC LEARNING OUTCOMES	
LEARNING OUTCOMES	**ASSESSMENT CRITERIA**
SECOND YEAR	
19. Interpret and apply GTAW Principle and methods, understand Advantages & Disadvantages.Select & applyGTAW Equipment's with procedure with quality standard, Position & Joints, defect causes & remedies.	19.1 Select power source as per material, size and type of Tungsten electrode, welding current, gas nozzle size, gas flow rate and filler rod size as per requirement.
	19.2 Prepare, set (Machine & Job) and tack the pieces as per drawing and type of joints.
	19.3 Set up the tacked joint in specific position.
	19.4 Deposit the weld by adapting proper welding technique and safety aspects.
	19.5 Carry out visual inspection to ensure quality of welded joint.
20. Apply Brazing Principle, Brazing methods & equipment's with procedure with quality standard, defect causes & remedies.	20.1 Plan & select the nozzle size, working pressure type of flame, filler rod & flux as per requirement.
	20.2 Prepare, set, and tack the pieces as per drawing.
	20.3 Braze the joint adapting proper brazing technique & safety aspect.
	20.4 Carry out visual inspection to ascertain quality weld joint.
21. Demonstrate Resistance welding, types, methods & equipment's with procedure.	21.1 Understand about various types of Resistance welding.
	21.2 Understand different types of equipment's used in welding
	21.3 Understand the different methods followed in welding.
	21.4 Understand the application of welding.
22. Perform Spot welding, Equipment, Accessories, Power source procedure.	22.1 Plan and select the material and clean the surface thoroughly
	22.2 Set the spot-welding parameters on machine.
	22.3 Spot weld the join adapting appropriate techniques & Safety.
	22.4 Inspect the joint for soundness of weld.
23. Plan and perform Car Under body Part joining by using Jigs & Fixtures.	23.1 Identify different type of Underbody parts like Front floor, Rear floor, Dashboard area.
	23.2 Identify different type of Child parts & dolly.
	23.3 Perform part setting of different floor part to JIG by operating Module (Electro pneumatic) to produce finished car body
	23.4 Perform joining process using different type of spot-welding gun. ('C' type &'X' type gun).
	23.5 Understand the purpose of Tip changing in spot gun. Tip bord importance.
24. Plan and perform Car Shell body Part joining by using Jigs & Fixtures.	23.1 Identify different types of Doors like, Front, Rear, Hood & Luggage Door.
	23.2 Identify different type ofReinforcement, Hinges &Child parts with Chorokyo dolly.
	23.3 Perform part setting of different Door Inner part to JIG by operating Module (Electro pneumatic) to produce finished Doors.

	23.4 Perform joining process using different type of spot-welding gun. ('C' type &'X' type gun).
	23.5 Understand the purpose of Tip changing in spot gun. Tip bord importance.
25. Maintain Quality standards in Car body Welding, Panel Surface, Door Fitting.	25.1 Identify the fitting & Level miss match in car shell body.
	25.2 Identify the Car shell body surface defect like Dent & Bump, Dig, Scratch by Oil stone hand feel & using light reflection (Visual) method
	25.3 Identify the Spot welding defects in car shell body like SPOT-Number of spots, Burr, Miss, Pitch, Position, Separation of Spot joint.
	25.4 Identify the Sealer miss, Bracket, Nut & Stud miss, Wrong part joined in car shell body.
26. Maintain Non defective condition to achieve customer satisfaction.	26.1 Understand the importance of Non defective condition.
	26.2 Understand the Non defective condition of Spot-weldingEquipment.
	26.3Understand the Non defective condition of Hammer & Chisel for Hanare check.
	26.4.Understand the Non defective condition of Jigs & Fixture.

8. SYLLABUS

SYLLABUS -AUTOMOTIVE WELD TECHNICIAN			
WEEK	**Reference Learning Outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
		First Year	
1-2	Recognize & comply with general safe working practices, environment regulation and housekeeping. Industry Orientation	**Workshop Safety (40 Hrs.)** 1. Importance of trade training, List of tools & Machinery used in the trade. 2. Safety attitude development of the trainee by educating them to use Personal Protective Equipment (PPE). 3. First Aid Method and basic training. 4. Safe disposal of waste materials like cotton waste, metal chips/burrs etc. 5. Hazard identification and avoidance. 6. Safety signs for Danger, Warning, caution & personal safety message. 7. Use of Fire extinguishers. 8. Safe use of tools and equipment used in the trade.	**Workshop Safety (10 Hrs.)** • Familiarization with the working of Industrial Training Institute system. • Importanceofsafetyandprecaution stobetakenintheindustry/shopfloo r.IntroductiontoPPEs. • Introduction to First Aid. • Response to emergenciese.g. power failure, fire, and system failure. **Importance of housekeeping & good shop floor practices.** • Introduction to 5S concept & its application. **Occupational Safety & Health:** • Health, Safety and Environment guidelines, legislations &regulations as applicable.
3-4	Perform measuring & marking by using various measuring & marking tools like Vernier calliper, Micrometre, Files, Scriber, Drill bit, & Grinding tools.	**Measurement system: (60Hrs.)** 1. Check zero error of instruments and adjust to zero. 2. Identification of tools & equipment as per desired specifications for filing and marking, visual inspection of raw material for rusting, scaling, corrosion etc. 3. Familiarization of bench vice. 4. Filing- File top of the "U" channel, check, and measure with steel rule. 5. Mark with scriber and steel rule 6. Mark with scriber and steel rule 7. Familiarization of Vernier Height Gauge. 8. Measuring practice with steel rule, Vernier Height Gauge. 9. File, mark straight and parallel lines with scriber and steel	**Measurement System: (10 Hrs.)** • Bench work – Metal working hand tools and devices –Work bench vices – files – hacksaw – hammer – chisels – spanners – screw drivers –scrapers. • Linear measurements- its units, steel rule dividers, callipers – types and uses, • Punch – types and uses. Description, use and care of • Marking table. • Vernier calliper – its parts, principles, reading, uses and care. • Outside micro meter – its parts, principles, reading, uses and care, • Vernier height gauge. • Marking tools – scriber, Dividers, • Dot punch, Centre punch. • Marking out – Coordinates

		rule/Vernier Height Gauge as per drawing. 10. Dot punching and letter and number punching. 11. Grinding of center punch, dot punch, flat chisel and scriber. 12. Drill grinding practice. 13. Drill Centering Practice. 14. Chain drilling practice 15. Practice on measuring instruments.	system, • Rectangular – Polar – Rules for marking media, marking blue, • Drilling machines-types &their application, construction of Pillar &Radial drilling machine. • Cutting Speed, feed, depth of cut and Drilling time calculations. • Measuring Instruments – purpose –Function- types – Calculation of • Least count of :-Vernier Caliper, Micro meter, height gauge, Spirit Level Gauge, Vernier bevel protector and Sine bar. • Bevel protractor, combination set their components, uses and cares. • Pedestal grinder, star wheel dresser, • safety precautions, care andmaintenance.
5-6	Identify &Understand the Electricity terminology.	**Basic electricity (50 hrs.)** 1. Prepare wire connections by joining wires using soldering Iron. 2. Construction of simple electrical circuits and measuring of current voltage and resistance. 3. Verify DC series & parallel circuits and its characteristics 4. Check out the open and short circuits in the lighting circuits 5. Using digital multimeter, practice continuity test for fuses, jumper wires, fusible links, circuit breakers. 6. Measures to rescue a person fromlive wires. Identify the phase, Neutral and Earthon power socket, use a tester to monitor AC power) 7. Construct attest lamp and use it to check mains healthiness. 8. Measure the voltage between phase and ground and rectify earthing. 9. Identify and test different AC mains cables.	**Basic electricity (10 hrs.)** • Basic electricity, • Electricity principles, • Type of Current_ AC,DC, their comparison, resistance, & their units. Conductor, insulator, Types of connections, - series, parallel, Ground connections, • Ohm's law, Voltage. • Fundamentals of electricity, definitions, units & effects of electric current. Conductors and insulators. Conducting materials and their Comparison

7-16	Apply Gas welding & Equipment's operation procedure with quality.	**Basics of Gas Welding (350 hrs.)** 1. Connect the cylinder to manifold system. 2. While connecting ensure Acetylene left hand tightening. 3. Check the Leakage condition after connection with soap water. 4. Set the proper pressure on Double stage regulator. 5. Check the Outgoing & cylinder pressure indicator. 6. Check the flash back valve. 7. Pre-operation check of Gas welding & Manifold as per instruction sheet. 8. Pre-operation check of gas welding equipment at stations like Gas leakages at hoses coupling area by soap water. 9. One touch coupling Connection of Hoses & Torch 10. Setting of oxyacetylene welding equipment like regulator- Oxygen set for 1kg/cm2 for welding & Acetylene set for 0.1kg/cm2 for welding 11. Practice -Ignition of torch & Extinction of torch operation as per procedure sheet 12. Lighting and setting of flame & Troch valve operation. 13. Check different flame like carburizing, Neutral flame & oxidization. 14. Demonstrate Four rounds of KYT, Problem with countermeasure. 15. Demonstrate the Rightward & leftward techniques. 16. Perform fusion run without filler rod on MS sheet 0.8m to 2mm thick in flat position. 17. Fillet "T" joint on MS-sheet 0.8mm to 2 mm thick in flat position. (1F) 18. Pre-operation check of Gas cutting station as per check sheet.	**Basics of Gas Welding (40 hrs.)** • Introduction and definition of welding. Different process of metal joining methods: Bolting, riveting, soldering, brazing, seaming etc. • Gas Welding Equipment, tools, and accessories. • Gas cylinder specification & International Standards with Fuel & Non-fuel gas classification. • Cylinders and Colour coding for different gas cylinders. • Explain with reasons - Acetylene gas pipeline is made up of Carbon steel & Oxygen gas pipeline is made up of Copper. • Properties of Different gases like Oxygen, Acetylene. • Different Safety device used in protect the cylinder like Regulator, Flash back arrestor, non-return valve. Manifold system, Cylinder cap. • Gas Welding terms and definitions. • Do's & Don'ts of Gas welding with Four rounds of KYT. • Different type so flames & used in different metals like carbon steel & copper. • Types of oxy-acetylene flames and uses. • Oxy acetylene gas welding Systems (Low pressure and High pressure). • Difference between gas welding blow pipe (LP & HP) and gas cutting blow pipe Gas welding techniques. • Rightward and Leftward techniques. • Gas welding filler rods, specifications, and sizes. Gas welding fluxes - types and functions. • Gas welding defects, causes, and remedies.

		19. Gas leakage check by soap water. 20. Torch working confirmation 21. Proper pressure setting on regulator. 22. Setting of oxy-acetylene welding equipment, Lighting and setting of flame. 23. Circular gas cutting on MS-plate 10 mm thick. 24. Bevelling of MS plates 10 mm thick. By gas cutting. 25. Marking and perform radial cuts, cutting out holes using oxy-acetylene gas cutting. 26. Identify cutting defects viz., distortion, grooved fluted or ragged cuts; poor draglines; rounded. edges; tightly adhering slag.	• Calcium carbide properties and uses. • Acetylene gas properties and generating methods. • Acetylene gas Purifier, Hydraulic back pressure valve and Flash back arrestor • parameters, and application. • Advantages of Oxy-Acetylene cutting process.
17-22	Perform Gas cutting, Safety & Equipment's operation procedure with quality, defect causes & remedies.	**Basics of Gas cutting (200 hrs.)** 1. Connect the cylinder to manifold system. While connecting ensure Acetylene left hand tightening. 2. Check the Leakage condition after connection with soap water. 3. Set the proper pressure on double stage regulator. 4. Check the Outgoing & cylinder pressure indicator. 5. Check the flash back valve. 6. Pre-operation check of Gas welding & Manifold as per instruction sheet. 7. Pre-operation check of gas cutting equipment at stations like Gas leakages at hoses coupling area by soap water. 8. One touch coupling Connection of Hoses & Torch. 9. Setting of oxyacetylene cutting equipment like regulator- Oxygen 10. Circular gas cutting on MS-plate 10 mm thick. 11. Bevelling of MS plates 10 mm thick. By gas cutting. 12. Marking and perform radial cuts,	**Basics of Gas cutting (20 hrs.)** • Theory of Metal cutting • Explaining How Carbon steel will lose his mechanical properties. • Explain Why only Carbon steel can cut by oxy-acetylene gas. • Common gases used for welding & cutting, flame temperatures and uses. • Chemistry of oxy-acetylene flame. • Parameters and application. • Advantages of Oxy-Acetylene cutting process. • Chemistry of oxy-acetylene flame. • Types of oxy-acetylene flames and uses. • Oxy-Acetylene Cutting Equipment principle, parameters, and application. • Advantages of Oxy-Acetylene cutting process.

		cutting out holes using oxy-acetylene gas cutting. 13. Identify cutting defects viz., distortion, grooved fluted or ragged cuts; poor draglines; rounded. edges; tightly adhering slag.	
23-26	Interpret and apply SMAW Principle and methods, understand Advantages & Disadvantages.	**Basics of Arc welding – SMAW (140hrs.)** 1. Ensure all PPE before entering welding station. 2. Do pre-operation check as per sheet mark OK or NG (Not Good). 3. Setting up of Arc welding machine & accessories and striking an arc by Brushing or Tapping method. 4. Straight line 30 to 70mm beads on M.S. plate 5 to 10 mm thick in flat position. 5. Straight line 150mm beads on M.S plate 5 to 10mm thick in flat position. 6. Weaved bead on M. S plate 10mm thick in flat position.	**Basics of Arc welding – SMAW (10 hrs.)** • Theory of SMAW, Shielded Metal arc welding like metal transfer & joining process take place. • Why, Flux coated electrode used in SMAW. • Electrode: types, functions of flux, coating factor, sizes of electrode Coding of electrode as per BIS, AWS, • Effects of moisture pick up. Storage and baking of electrodes. • Special purpose electrodes and their applications.
27-36	Select & apply SMAW Equipment's with procedure with quality standard, Position & Joints, defect causes & remedies.	**Advance Arc welding- SMAW (350 hrs.)** 1. Square butt joint on M.S. sheet 5 to 10mm thick in flat Position. 2. Fillet "T" joint on M. S. Plate 10 mm thick in flat position. 3. Open corner joint on MS sheet 5 to 10 mm thick in flat Position. 4. Fillet lap joint on M.S. plate 10 mm thick in flat position. 5. Fillet "T" 10 mm thick in Horizontal position. 6. Fillet Lap joint on M.S. Plate 10 mm in vertical position. 7. Single "V" Butt joint on M S plate 12 mm thick in vertical position (3G).	**Advance Arc welding – SMAW (40 hrs.)** • Arc welding machine: Power source, Step down transformer working principle & OCV (Open circuit voltage) Arc voltage, Constant current characteristics. • Arc welding power sources: Transformer, Motor Generator set, Rectifier and Inverter type welding machines and its care & maintenance. • Arc length – types – effects of arc length. • Polarity: Types and applications. • Advantages and disadvantages of A.C. and D.C. welding machines. • Welding positions as per EN & ASME : flat, horizontal, vertical and overhead position. Weld slope and rotation. causes and

			Remedies. • Weld quality inspection, • common welding mistakes and appearance of good and • Weld defects causes & remedies. • Weld gauges & its uses
37-40	Interpret and apply GMAW Principle and methods, understand Advantages & Disadvantages.	**Basics of Arc welding - GMAW (140 hrs.)** Familiarization with the machinery used in the trade. 1. Introduction to safety equipment and their use etc. 2. Setting up of GMAW welding machine & accessories. 3. Arc generation & current & voltage setting on MS plate by GMAW welding. 4. Straight line30mm & 70mm & 150 mm bead on MS plate GMAW welding	**Basics of Arc welding -GMAW (10 hrs.)** • Outline of the subjects to be covered. Safety precautions pertaining to GMAW. • Introduction to GMAW – equipment – accessories. Various names of the process. (MIG-MAG/ CO2 WELDING, FCAW). Advantages & Limitations.
41-50	Select & apply GMAW Equipment's with procedure with quality standard, Position & Joints, defect causes & remedies.	**Advance Arc welding – GMAW (350 hrs.**) 1. Lap joint on MS plate by GMAW welding in down hand position. 2. Open corner joint on MS plate in down hand position. 3. "T" joint on MS sheet in flat position 4. "T" joint on MS sheet in horizontal position. 5. "T" joint on MS sheet in vertical position. 6. "T" joint on MS sheet in overhead position. 7. Single "V' butt joint by C02 welding in down hand position. 8. Single "V' butt joint by Argo shield welding in flat position (Gas: Argon and CO2 mixture).	**Advance Arc welding – GMAW (30 hrs.)** • Power source & accessories Wire Feed unit. Types of shielding gases & advantages. • Welding Gun & its parts. Modes of metal transfer - Dip, Globular, spray & pulsed transfer, and its significance. • Flux cored arc welding. Welding wire types and specification. • Trouble shooting in MIG welding. Data and Tables related to CO2 welding. • Reading of Welding procedure specifications (WPS). • Types of weld defects, causes and remedy in GMAW process.
51	**Revision, Project work (40 hrs.)**		
52	**Examination (25 hrs.)**		
53-56	Interpret and apply GTAW Principle and methods, understand	**Basics of Arc welding - GTAW (135 hrs.)** Familiarization with the machinery used in the trade.	**Basics of Arc welding – GTAW (20 hrs.)** • Outline of the subjects to be covered. Safety precautions

	Advantages & Disadvantages.Select & applyGTAW Equipment's with procedure with quality standard, Position & Joints, defect causes & remedies.	1. Introduction to safety equipment and their use etc. 2. Setting up of GTAW welding machine & accessories. 3. Straight line beads on MS plate by GTAW welding. 4. Lap joint on MS plate by GTAW welding in down hand position. 5. Setting up GTAW welding plant and establishing the arc. Beading practice on MS sheet by GTAW. 6. Square butt joint on MS in down hand position. 7. Open corner joint on MS sheet in down hand position. 8. Lap joint on MS sheet in down hand position. 9. Tee joint on MS sheet in down hand position. 10. Lap joint on MS sheet in Horizontal position. 11. Square butt joint on MS sheet in Horizontal position.	pertaining to GTAW • Introduction to GTAW welding Various names of the process. (TIG, Argon arc welding). Equipment & accessories. Advantages & Limitations. • Power source - Types, polarity, and application Accessories - HF unit and DC suppressor. • Tungsten electrode, Types, sizes, and uses. coding as per BIS & AWS. Type of shielding gases- Types & properties. • GTAW Welding consumables Types & Specifications as per BIS & AWS • Tables & data relating to TIG welding. Different type of weld joints- plates & pipes. • Edge preparation of plates & pipes. Fitting of joint plates for TIG Welding. • Types of weld defects, causes and remedy in GTAW process.
57-60	Understand about Brazing Principle, application methods & equipment's with procedure with quality standard, defect causes & remedies.	**Basics of Brazing (135 hrs.)** 1. Ensure all PPE before entering welding station. 2. Pre-operation check of gas welding equipment at stations like Gas leakages at hoses coupling area by soap water. 3. One touch coupling Connection of Hoses & Torch 4. Setting of oxyacetylene welding equipment& Flux tank connection 5. Set pressure on Regulator based on different metals. 6. Practice -Ignition of torch & Extinction of torch operation as per procedure sheet 7. Lighting and setting of flame & Troch valve operation. 8. Check different flame like carburizing, Neutral flame & oxidization. 9. Demonstrate four rounds of KYT, Problem with countermeasure.	**Basics of Brazing (20 hrs.)** • Introduction and definition of welding. Different process of metal joining methods: brazing, seaming etc. • Brazing Welding Equipment, tools, and accessories. • Various Braze Welding Processes and its applications. • Brazing terms and definitions. • Do's & Don'ts of Brazing with Four rounds of KYT. • Brazing Torch explanation. • Liquid Flux tank importance & Do's & Don'ts. • Different type so flames & used in different metals like carbon steel & copper. • Difference between Regular Brazing & Silver Brazing Systems. • Rightward and Leftward techniques. • Brazing filler rods, specifications,

		10. Demonstrate the Rightward & leftward techniques. Perform fusion run filler rod (Copper & Tin) on MS sheet 0.8m to 2mm thick in flat position. Demonstrate Four rounds of KYT, Problem with countermeasure.	and sizes. Brazing fluxes - types and functions. • Brazing defects causes and remedies. • Acetylene gas properties and generating methods.
61-64	Demonstrate Resistance welding, types, methods & equipment's with procedure.	**Basics of Resistance welding –(130 hrs.)** Entering welding station with proper PPE 2. Seam welding machine Pre-operation check as per sheet, Mark OK, or NG. 3. Setting up of Seam welding machine & accessories. 4. Confirm the tip change & Water, Air pressure as per the standard. 5. Set proper current based on thickness of material. 6. Set the job piece as per Lap joint & hold buy grip plier. 7. Confirm the spot welding with Weld & No weld mode. 8. Do spot welding as the drawing. 9. Quality Check - spot nugget as per standard like spot defects & strength check.	**Basics of Resistance welding - (20 hrs.)** • Outline of the subjects to be covered in Resistance welding. • Different Types of Resistance welding like Seam weld, Projection & Spot welding. • Different Types of Resistance welding Equipment& accessories. • Advantages & Limitations Resistance welding • Power source – Step down transformer unit, Amperes, Timer unit in Resistance welding.
65-74	Perform Spot welding, Equipment, Accessories, Power source procedure.	**Basics of Spot welding–(340 hrs.)** 1. Entering welding station with proper PPE 2. Spot welding machine Pre-operation check as per sheet, Mark OK, or NG. 3. Setting up of Spot-welding machine & accessories. 4. Confirm the tip change & Water, Air pressure as per the standard. 5. Set proper current based on thickness of material. 6. Set the job piece as per Lap joint & hold buy grip plier. 7. Confirm the spot welding with Weld & No weld mode. 8. Do spot welding as the drawing. 9. Quality Check - spot nugget as per standard like spot defects & strength check.	**Basics of Spot welding - (30hrs.)** • Outline of the subjects to be covered in Resistance welding. Safety precautions pertaining to SPOT WELDING • Introduction to SPOT WELDING Various names of the process. Equipment & accessories. • Advantages & Limitations of Spot welding • Manual & Robo spot welding. • Power source – Step down transformer unit, Amperes, Timer unit, Programming through remote. • Kick-less cable & Aid cable, Water pressure standard. Requirement, & Air pressure standard &Requirements. • Different types of Gun like C & X

			gun, • Tip Importance & different types Tip, • Tip Changing sequence &Tip board management. • Different types of spot defects (8 Numbers), causes & Remedies. • Spot welding Quality standards for Normal Spot & KAKU spot & Hanare standard.
75-84	Plan and perform Car Under body Part joining by using Jigs & Fixtures.	**Joining of Car Under body (340 hrs.)** 1. Front floor part setting in Jig joining by spot welding gun (C & X type). 2. Rear floor part setting in Jig joining by Spot welding & Stud welding. 3. Dash panel part setting in Jig & Joining by spot welding (C & X type)& Stud welding gun. 4. RH quarter panel & LH quarter panel part setting in Jig joining by spot welding gun. 5. Mastic sealer application & Anti spatter gel application 6. Sealer Drum changing as per Standard instruction sheet. 7. Trouble shooting of M-jig, Electro-pneumatic Module, Jig, Sealer Pump machine.	**Joining of Car Under body (30 hrs.)** • Explain the Just in time concept, Heijunka in production process, Andon- board used in production line. • Different Sections of Car body manufacturing process. • Importance of UNDER BODY & its Parts, Jig, Spot guide, Quality standard. • Importance of SIDE MEMBER & its Parts, Jig, Spot guide, Quality standard. • Importance of MAIN BODY & its Parts, Jig, Spot guide, Quality standard. • Importance of SHELL BODY SUB ASSEMBLY & its Parts, Jig, Spot guide, Quality standard. • Importance of Hemming machine & Trouble shooting • Importance of Sealer used in Door panel & other part of car shell body Hemming & Mastic.
85-94	Plan and perform Car Shell body Part joining by using Jigs & Fixtures.	**Joining of Shell body (340 hrs.)** 1. Front door Inner part setting in Jig joining by spot welding gun (C & X type). 2. Front door Outer part preparation using Hemming sealer & place the door Inner part & send to Hemming machine for complete door assembly. 3. Rear door Inner part setting in Jig & Joining by spot welding gun (C & X type). 4. Rear door Outer part preparation using Hemming sealer & place the	**Joining of Car Shell body (30 hrs.)** • Kanban system, Service parts, Pre-operation check sheet, TIP, changing process, Hanare check. Muda, Muri & Mura in process. • Importance of Shell body & its Parts, Jig, Spot guide, Quality standard. • Importance of Hemming machine & Trouble shooting • Importance of Sealer used in Door panel & other part of car shell body Hemming & Mastic.

		door Inner part & send to Hemming machine for complete door assembly. 5. Hood Inner & Outer part assembly by using Jig & Spot-welding gun, Hinges fitment by bolt. 6. Sealer Drum changing as per Standard instruction sheet. 7. Trouble shooting of Hemming machine, Electro-pneumatic Module, Jig, Sealer Pump machine.	• Reinforcement part used in Door. • Importance of Impact beam used in door. • Importance of Hinges & Child part used in door. • Importance of Tape sealer & Mastic sealer used in doors. • Purpose of Die cleaning.
95-98	Maintain Quality standards in Car body Welding, Panel Surface, Door Fitting.	**Quality Control System of Car body (130 hrs.)** 1. Check the Car shell body surface defect Dent & Bump level 2 & 3 by Hand feel suing single pair gloves. 2. Check the Car shell body surface defect Dent & Bump level 4 to 6 by Visual using Tube light reflections. 3. Repair the surface defect like Dent & Bump by using various hand tools like, Pinching tool, file, buffer, sander & Oil stone. 4. Check the other car shell body Door fitting defects like Level NG, Gap NG. 5. Check & Identify the fitment problem Assembly part vs Weld shell body. 6. Confirm the Door accuracy by using Checking Fixture. 7. Check Hanare (Spot separation by Destructive & Non-destructive method. Standard stock – Minimum & Maximum stock confirmation at Dolly (Chorokyo) & working area	**Quality Control System of Car body (15 hrs.)** • Definition of Quality • Quality characteristics of Car shell body like Characteristics, Welding, fitting, Part assembling & Surface • Different types of quality control processes used in automotive manufacturing shop • Functions of various departments in quality like Quality Inspection, Quality Engineering, Quality Assurance, control procedures • Inspection Process • Final Audit Tests • Importance of BAM- Body Accuracy Management
99-102	Maintain Non defective condition to achieve customer satisfaction.	**Quality from Customer point of view (130 hrs.)** 1 Spot welding equipment confirmation based on Non defective condition. 2 JIG confirmation by process member based on Non defective condition sheet. 3 Car body part confirmation based on Non defective condition sheet.	**Quality from Customer point of view (15hrs.)** • Customer point of view Hanare check. • Customer point of view Spot welding NP check point. • Importance of KIJ • Customer point of view importance of KAKU spot. • Importance of DOK & DPV. • Importance of Quality person

		4 Hand Tools confirmation based on Non defective condition sheet. 5 Car body Surface confirmation based on Non defective condition sheet. 6 Hanger & Hoist confirmation based on Non defective condition sheet. 7 Car body Fitting confirmation based on Non defective condition sheet.	• Importance of Cut check & Sealer application.
103	**Revision, Project work (40 hrs.)**		
104	**Examination (25 hrs.)**		

9. SYLLABUS - CORE SKILLS

9.1 WORKSHOP CALCULATION &SCIENCE

S No.	Workshop Calculation	Workshop Science
FIRST YEAR – 75 Hr		
1.	**Unit**: Systems of unit- FPS, CGS, MKS/SI unit, unit of length, Mass and time, Conversion of units	**Material Science**: properties - Physical & Mechanical, Types – Ferrous & Non-Ferrous, difference between Ferrous and Non-Ferrous metals,introduction of Iron, Cast Iron, Wrought Iron, Steel, difference between Iron and Steel, Alloy steel, carbon steel, stainless steel, Non-Ferrous metals, Non- Ferrous Alloys.
2.	**Fractions:** Fractions, Decimal fraction, L.C.M., H.C.F., Multiplication and Division of Fractions and Decimals, conversion of Fraction to Decimal and vice versa. Simple problems using Scientific Calculator.	**Mass,Weight and Density**: Mass, Unit of Mass, Weight, difference between mass and weight, Density, unit of density, specific gravity of metals.
3.	**Square Root:** Square and Square Root, method of finding out square roots, Simple problem using calculator.	**Speed and Velocity**: Rest and motion, speed, velocity, difference between speed and velocity, acceleration, retardation, equations of motions, simple related problems.
4.	**Ratio & Proportion**: Simple calculation on related problems.	**Work, Power and Energy**: work, unit of work, power, unit of power, Horse power of engines, mechanical efficiency, energy, use of energy, potential and kinetic energy, examples of potential energy and kinetic energy.
5.	**Percentage:** Introduction, Simple calculation. Changing percentage todecimal and fraction and vice-versa.	
6.	**Algebra**: Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).	**Heat & Temperature**: Heat and temperature, their units, difference between heat and temperature, boiling point, melting point, scale of temperature, relation between different scale of temperature, Thermometer, pyrometer, transmission of heat, conduction, convection, radiation.
7.	**Mensuration :**Area and perimeter of square, rectangle, parallelogram, triangle, circle, semi circle, Volume of solids – cube, cuboid, cylinder and Sphere. Surface	**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,

	area of solids – cube, cuboid, cylinder and Sphere.	Horse power, energy, unit of electrical energy.
8.	**Trigonometry:** Trigonometrically ratios, measurement of angles. Trigonometric tables	**Levers and Simple Machines:** levers and its types. Simple Machines, Effort and Load, Mechanical Advantage, Velocity Ratio, Efficiency of machine, Relationship between Efficiency, velocity ratio and Mechanical Advantage.
SECOND YEAR – 75 Hr		
1.	Geometrical construction & theorem:division of line segment, parallel lines,similar angles, perpendicular lines, isosceles triangleand right angled triangle.	- Forces definition. - Compressive, tensile, shear forces andsimple problems. - Stress,strain, ultimate strength, factor ofsafety. - Basic study of stress-strain curve for MS.
2.	- Area of cut-out regular surfaces: circle andsegment and sector of circle.	- Temperature measuring instruments. - Specific heats of solids & liquids.
3.	- Area of irregular surfaces. - Application related to shop problems.	- Thermal Conductivity, Heat loss andheat gain.
4.	- Volume of cut-out solids: hollow cylinders,frustum of cone, block section. - Volume of simple machine blocks.	- Average Velocity, Acceleration &Retardation. - Related problems.
5.	- Material weight and cost problemsrelated to trade.	- Circular Motion: Relation betweencircular motion and Linear motion,Centrifugal force, Centripetal force
6.	- Finding the value of unknown sides andangles of a triangle by Trigonometricalmethod.	- Friction- co-efficient of friction,application and effects of friction inWorkshop practice. - Centre of gravityand its practicalapplication.
7.	- Finding height and distance bytrigonometry.	- Magnetic substances- natural andartificial magnets. - Method of magnetization. Use ofmagnets.
8.	Application of trigonometry in shop problems. (viz. taper angle calculation).	- Electrical insulating materials. - Basic concept of earthing.
9.	**Graph:** - Read images, graphs, diagrams bar	- Transmission of power by belt,pulleys& gear drive.

	chart, pie chart. - Graphs: abscissa and ordinates, graphs ofstraight line, related to two sets of varyingquantities.	- Calculation of Transmission ofpower by belt pulley and gear drive.
10.	Simple problem on Statistics: - Frequency distribution table - Calculation of Mean value. - Examples on mass scale productions. - Cumulative frequency - Arithmetic mean	- Heat treatment and advantages.
11.	Acceptance of lot by sampling method(within specified limit size) with simpleexamples (not more than 20 samples).	Concept of pressure – units ofpressure, atmospheric pressure,absolute pressure, gauge pressure –gauges used for measuring pressure Introduction to pneumatics &hydraulics systems.

Syllabus – Engineering Drawing

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

9.2 EMPLOYABILITY SKILLS

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

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

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

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

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

Concept of Quality Management(QMS)& PDCA	Concept of Quality Management (QMS), PDCA, Fishbone, 5S, 5D, KAIZEN	
Concept of ISO	Introduction of ISO	
11. Preparation to the world of work		**Duration: 05 Hr. Marks:**
Career Plan	Identify the difference between job and career	
Basic Professional Skills	Job roles available in respective trades	
Career Pathways	Awareness of industries, and the respective professional pathways	
Search and apply for a job	Awareness of higher education/up skilling (short-term) options Steps involved in online application for Instructor course, Apprenticeship and different jobs in popular site like the indiajobs.com, naukri.com, monsterindia.com, Govt. website.	
12.CustomerInteraction/ service		**Duration: 05 Hr. Marks:**
Greeting customers	Forms of greeting	
Probing-understanding Customer requirements	Use of positive body language	
Handling grievances	Handling grievances (Use of ask-listen-repeat technique)	
Relationship building with customers	Relationship building with customers, importance of probing.	
To identify the importance of probing	Use of open-ended/close-ended questions to gauge requirement	

Second Year-60 Hr		
Module	**Topics**	**Methodology**
1. English Literacy		**Duration: 20Hr. Marks:12**
Me/Myself,We/Ourselves	Greetings Introducing yourself Talking about your family Likes and dislikes	Student speaks & writes 1 paragraph about themselves
Role Models	Introduce their role model Discuss strength and weakness/ criticism etc. Adjectives, verbs, pronouns etc. all covered. Write-up about this person	Group activity–who are the role models of each group. Displayed on a chart with pictures and text– make a collage and present.
My Society	Describe your surrounding Changes in your environment Dos and dont's Dumping of garbage Use of plastic Water conservation	Summarizing the discussion Pictures of something in the past/ what it is now

	Strength and weakness Roads /pollution Gardens	
My Interests	Theme parks Historical areas/cities (places) Adventure–sea, mountain, beaches Hobbies	Student speaks about their favorite place/area of interest/ hobby and why they like it
My Work	What they want to do Why they want to do it What do they know about this opportunity Competition/sector	Bring a newspaper clipping/news item of that industry and discuss it [individual activity–everyone has to talk about it and write about it]
App based Learning	Actual speaking practice–all 4 skills tested Gamified Vernacular Capability Mapped to what is covered in class Benefits Interactive Self-confidence High engagement	App based learning practice by the trainee using popular apps available
2. Communication Skills		**Duration: 10 Hr.** **Marks: 12**
Personal	Reflection Template Revision Importance of Communication Managing Emotions Create online profile +Form al Introduction of self (based on the industry)	Self-reflection-Pg193 Case study from the workplace-videos Reflection on Industry visit Digital practice + Classroom Practice
Interpersonal	Giving and Receiving Feedback Communication based on context-Formal, Informal Verbal &Non-verbal Listening Skills Gender Sensitivity Application of Gender sensitivity	Burgar Feedback Template & Practice Role play and Peer Evaluation Role Play & Reflection Gender Pledge
Workplace Communication	Interview Preparation (With Resume, Formal Dress) Communication Etiquette: a. MobileApplicationsfor theworkplace b. FakeNews Customer Interaction a. Definingmycustomer(other	Career Day: Scenario based activity, with Guest Lecture or HR person Reflection of Market Scan Trade specific examples + Role play Case Study, Role Play Case Study, Digital practice via email

	department, client) b. Communicationbased on the customerbaseWorkplaceCommunication- Peer,Superior, Junior Formal Communication - Practice	
3.I.T.Literacy		**Duration: 10Hr.** **Marks: 10**
MS-PowerPoint	Basics -creating, opening, closing, slide show	ppt, audiovisual, task-based activities.
File Conversion & Reducing file size	Identify file types, types of files- pdf, jpg, doc, excel, ppt Converting files to other types	ppt, demonstration & practice
Data/webcasting Through mobile	Casting desktop application or web application By WIFI or Bluetooth	Demonstration &practice
Server & cloud computing	Introduction to server and cloud computing accessing, storing and retrieving file through google drive	audio visual, task-based activity, demonstration
Language translation	Language translation throughvoice Voice to text, text to voice application	task-based, demonstration
Customize and use online CVs	Access CV templates online Customize CVs as per requirement	task-based, demonstration
Artificial Intelligence	latest technology based model or simulated software	Demonstration &practice
4. Entrepreneurship Skills		**Duration: 10Hr.** **Marks:6**
Entrepreneurship Mindset	Aspect of inspiring/motivating should be sprinkled across all topics. Recall the qualities/characteristics. Being a leader (your values, personal code of conduct)(ownership for my enterprise). Listen, Learn and Observe (framework of an effective leader) Grit (***Addressing difficulties/***	Share experience of successful entrepreneurs (examples of alumni from ITI)(Can be given as an instruction to teachers)

	challenges in an entrepreneur's life positively) Managing personal time ***Focus on breaking myths related to entrepreneurship wherever possible.***	
Opportunity identification	Selection of type of business - Product/service/trading UVP–unique idea about the business Being environment friendly (to be touched upon in as many activities that learner is taking part in) Reminder about Business model framework	Systems thinking and then doing market research (***related to innovation and problem solving done by other players in the market***)
Being Resourceful	Being resourceful Identify ways of being resourceful– Inexpensive ways of marketing Networking Importance of Networking (interpersonal skills, communication skills related activity) How to connect (through Net and otherwise– bring in English and IT skills related activity) Business model revisit	communication skills related activity project English and IT skills related activity Business model revisit Connecting with likeminded people
Ease of Doing Business	Single window mechanism for running thebusiness How to apply for business, awareness of statutory compliances, and govt or non govt schemes Business model revisit activity	learner can be directed to it through communication and inter personal focused activities
Managing Resources	Human resource (customers and internal employees or other entities in the business cycle) Finance(activities to bring about importance of financial literacy) Infrastructure (location, equipment, machinery etc.) Use of Internet (importance of IT	Activities will bring about Importance of communication and interpersonal skills

	skills)Business model revisit activity	
Mentorship and Role Models	Importance of mentorship They will to look at mentors in their own ecosystem, connecting with them through Net or otherwise again.	Interpersonal skills, communication and IT skills can be reinforced
Learning Cycle	Business model revisit (it's an ever-evolving Model and you may need to revisit the model and different aspects of it along with your own capabilities, revisit mindsets frequently, being a lifelong learner by being aware of skills and attitudes displayed by other successful entrepreneurs.	Role Play/live demonstration Skills and attitudes displayed by other successful entrepreneurs
5. Sustainable Career		**Duration:10 Hr.** **Marks:10**
Career Awareness	Learn and explore upcoming advances in the industry Students will be able to connect all the subsequent topics with real-life experience, and understand the importance of mastering career planning and readiness topics Gain exposure to a modern workplace from his/ her industry	Webinar / online pre-recorded lectures from industry representatives. Visit / view a video on online portal /interact with industry experts. A video about the evolution of workplace in the past few years (past to future). The students must get a template to record the insights from the visit/interaction like a simple worksheet.
Career Planning	Learn and apply growth mindset to career planning Ashok Leyland shares an example- they are undergoing an extensive tech. overhaul and technicians will have to learn new things to stay relevant/ updated in thei.r jobs. Learn about personal skills and interests Adapt to ever-changing business environment Learn about continuous upskilling/ re skilling learning requirements in their industry	Case studies / self-awareness activities/ mapping the barriers to growth mind set in everyday life, and devising strategies to apply growth mindset through easy-to- implement actions everyday. Write 16PF, or other relevant personality tests that gives students an insight into their strengths, and also provides them a vocabulary to express their personal strengths and interests Case studies/team work activities to practice adaptability/ working in

	ITI students should be aware that their skilling Journey will continue for life, and will not end with the end of final year. Map career pathways within your sector	ambiguity /openness to change in industry. Online job search / advanced market scanning related to their chosen sectors- update your year 1market scan. Within the same market scan activity-explore both-jobs and self-employment opportunities Share a template on which students can envision their future of work - identify what your workplace looks liketoday - through market research, online content etc. and what it will look like in a decade. QA has developed videos on how new jobs will look different from today's jobs. Anticipate challenges (apprenticeships, untimely termination, location of job-be open to migration, assess cost of living etc.) Common future plan template –for planning a self- employment journey/career options Share relevant keywords / direction for conducting a career pathway search for each trade
Career Readiness	Practice writing technical evaluations / aptitude test. Communicate their fit (positive attitude /adaptability/self-led learner) during the interview. Final year students are placement read. Hence, placement preparation. Prepare and review final resume. Identify and apply for apprenticeships on NAPS. Register on government job portals (national and state). Learn and apply for DST / internship opportunities.	Conduct a mock interview exercise involving a panel, which includes industry representative, college faculty, HR (desired) Scores/internship experience etc. is most relevant Employment Exchange / Youth Employability Services What is an internship? Structured and unstructured. State Skill Development Missions portals.

	Apply for jobs (practice reading key words in job descriptions, understand salaries and benefits) Request and receive feedback to improve performance. Develop cultural intelligence. Respecting gender equality at workplace. Cultivating professional attitude. Apply green practices in life and career.	Respecting my time/others time, work/life balance, cooperativeness/ quality conscious /teamwork/empathy /commitment/ deliver on time.

ANNEXURE-I

LISTOF TOOLS&EQUIPMENT		
AutomotiveWelding Technician(Forbatchof20 Candidates)		
S.NO	**TOOLS, EQUIPMENT,MACHINERIESAND VEHICLES**	**QTY**
1.	Straight Snip	12 nos.
2.	Curved Snip	12 nos.
3.	Scriber	12 nos.
4.	Steel rule 300mm	12 nos.
5.	Steel rule 600mm	12 nos.
6.	Compass 300mm	12 nos.
7.	Compass 150mm	12 nos.
8.	Hacksaw frame	12 nos.
9.	Half round files	12 nos.
10	Level hammer Large	12 nos.
11	Pneumatic Grinder	4 nos.
12	Pneumatic Drilling gun	4 nos.
13	Wooden hammer- Mallet	12 nos.
14	Open edge spanner 28no.	2 nos.
15	Chisel	8 nos.
16	Wire brush	8 nos.
17	Chipping hammer	8 nos.
18	Cylinder change spanner	3 nos.
19	Needle file set	12 nos.
20	File cleaning brush	8 nos.
21	Wire Brush	8 nos.
22	Surface plate	12 nos.
23	Gas lighter	8 nos.
24	Nose Plier	8 nos.
25	Chipping Hammer	8 nos.
26	Ball Peen Hammer	8 nos.
27	Brazing Torch	8 nos.
28	Gas cutting Torch	8 nos.
29	Gas welding Torches	8 nos.
30	Wire Toothbrush	8 nos.
31	Flash back arrestor Oxygen	8 nos.
32	Double stage Regulator Oxygen	8nos.
33	Double stage Regulator Acetylene	8 nos.
34	Flash back Arrestor Acetylene	8 nos.

List of Machine and equipment		
35	Spot welding machine – Stationery	2 nos.
36	Spot welding machine- Portable with simulation	2 nos.
37	Spot welding Tip changing simulation	1 no.
38	Door repair Jig	1 no.
39	Door Outer panel surface identification defect Jig	1 no.
40	Door Outer panel part setting Jig	1 no.
41	Sheet metal bending Jig	1 no.
42	Brazing Flux tank	4 nos.

Annexure II

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

General Assessment

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

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

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