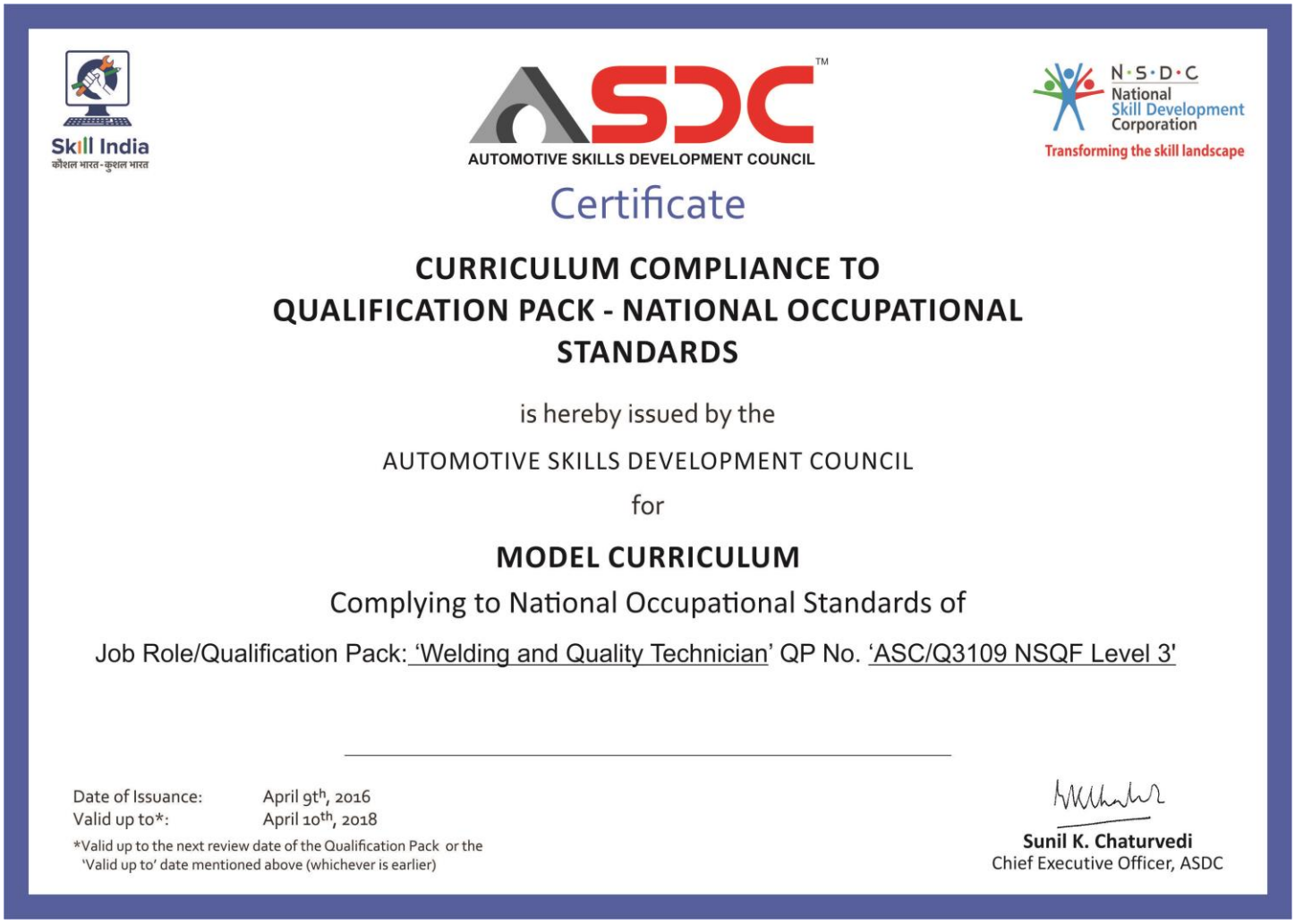
Model Curriculum

Welding and Quality Technician

SECTOR:	**AUTOMOTIVE**
SUB-SECTOR:	**WELDING**
OCCUPATION:	**MANUFACTURING**
REF ID:	**ASC/Q3109**
NSQF LEVEL:	**3**



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AUTOMOTIVE SKILLS DEVELOPMENT COUNCIL

N·S·D·C National Skill Development Corporation
Transforming the skill landscape

Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK - NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

AUTOMOTIVE SKILLS DEVELOPMENT COUNCIL

for

MODEL CURRICULUM

Complying to National Occupational Standards of

Job Role/Qualification Pack: 'Welding and Quality Technician' QP No. 'ASC/Q3109 NSQF Level 3'

Date of Issuance: April 9th, 2016
Valid up to*: April 10th, 2018

*Valid up to the next review date of the Qualification Pack or the 'Valid up to' date mentioned above (whichever is earlier)

Sunil K. Chaturvedi
Chief Executive Officer, ASDC

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Welding and Quality Technician

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a "Welding and Quality Technician ", in the "Automotive" Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	**Welding and Quality Technician**		
Qualification Pack Name & Reference ID.	ASC/Q3109		
Version No.	1.0	**Version Update Date**	
Pre-requisites to Training	Class 10th /I.T.I in Mechanical/Electrical		
Training Outcomes	**After completing this programme, participants will be able to:** • Understand the job requirement and the equipment to be used. • Understand the work output required from the process. • Select the type of electrode and the filler material for the welding process. • Understand selection of various parameters like welding current, voltage, electrode distance and similar items. • To install the welding work pieces on the apparatus. • Check the operations of the machine and conduct the actual welding process. • Check the measurement instruments for monitoring the welding process, parameters. • Understand unloading the finished good using suitable equipment like (hoist, lift, etc) Ensure there is no damage to the lifted work piece. • To keep a record of the finished goods. • Perform complete visual and dimension check as per product drawing • Document the observations in the inspection check sheet. • Handle inspection equipment and instruments like vernier, micrometer and height gauge. • Create and sustain a safe & clean environment. • Identify activities which can cause potential injury, through sharp objects, gas leakage, burns, fumes, etc. • Ensure sorting, streamlining and organizing storage and documentation, cleaning, standardization and sustenance across the plant and office premises of the organization.		

This course encompasses _9_ out of _9_ National Occupational Standards (NOS) of "Quality Inspector Level 3" Qualification Pack issued by "Automotive skill Development Council".

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
1.	Introduction	08.00	00:00	• General Discipline in the class room • General Safety Rules • Introduction to Automotive Industry • Familiarization about various auto manufacturers • Familiarization of terms associated with the sector • Brief outline about the course • Job Opportunities for a welding and quality technician • Career growth path for a welding and quality technician	Nil	• Class Room Size • Chairs/Tables • Computer with Internet • LCD Projector with Screen • Trainer chair and table • Demonstration table • Pin up boards • White Board with Marker • Work table with Bench Vice
2.	Understand welding job requirements and related processes	20.00	40.00	• Understand the engineering drawing, sketches and work order • Understand what process and equipment will be used to deliver required output. • Understand the does and don'ts of the manufacturing process as defined in SOP/work instruction or defined by supervisors • Understand impact of various physical parameters like temperature, pressure, electrode distance on the properties of final output product like durability, ductility & surface feel etc.	ASC/N 3103	• Different types of joints • Bench Drill • Drills & Taps • Bench Grinder • AC/DC Arc welder • Electrode Holder • Electrodes (M.S) • Welding booth with Exhaust (3' x 2.5' x 3.5') • Metal Inert Gas welding (MIG) Set (Single phase) • Wire feeder and Roll • Co2 gas cylinder + Regulator + gas heater & flow meter • Torch with Nozzle • Tungsten Innert gas Welding (TIG) set with Electrode • Argon gas cylinder • Hammer/Chipping • Wire Brush • Spot/Projection Welding machine with tips • Equipment for Brazing and Soldering

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
						• Tool Box with different sizes of Round & open end spanners • Hydraulic & lubricating oil • Consummables like electrodes gas cylinder & similar item • Fixtures for holding components • Defective & good samples of weld • Control plan, operation std & work Instructions • Vernier • Micrometer • Surface plate • V Block (magnetic) • Height Gauge • Straight Edge & Squares • Abrasive Cutter for Samples • Polishing machine • HNo3 Acid for Penetration check • Hardness Tester • Sample parts from small to big for practicing welding in various thickness • Goggles • Protective Gloves • Shields • Ear Plugs • Aprons • Safety Shoes • Fire Fighting Equipment • First Aid Box • Maintenance Mannuals and Welding handbooks • Necessary spares of machines voltage & current meters • Standards for weldings symbols • Standards of GD & T BIS,

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
						ASME & ASTM • Welding Simulators
3.	Prepare the welding machine for the welding process	15.00	30.00	• Understand the right welding methodology and process to be adopted for completing the work order from the supervisor. • Understand the various welding parameter like electrode type, electrode distance (gaps) welding current, voltage, process time before starting welding process • Understand the material required and the equipment availability for executing the activity. • Understand the type of electrode in terms of electrode material & thickness, filler material and flux which will be required for the selected welding process before start of welding. • Understand setting up welding apparatus as per the selected welding process & SOP and the setting standards of machine. • Remove any extra material, sharp edges swhich might impact the final welded product	ASC/N 3104	• Different types of joints • Bench Drill • Drills & Taps • Bench Grinder • AC/DC Arc welder • Electrode Holder • Electrodes (M.S) • Welding booth with Exhaust (3' x 2.5' x 3.5') • Metal Inert Gas welding (MIG) Set (Single phase) • Wire feeder and Roll • Co2 gas cylinder + Regulator + gas heater & flow meter • Torch with Nozzle • Tungsten Innert gas Welding (TIG) set with Electrode • Argon gas cylinder • Hammer/Chipping • Wire Brush • Spot/Projection Welding machine with tips • Equipment for Brazing and Soldering • Tool Box with different sizes of Round & open end spanners • Hydraulic & lubricating oil • Consumables like electrodes gas cylinder & similar item • Fixtures for holding components • Defective & good samples of weld • Control plan, operation std & work Instructions • Vernier • Micrometer • Surface plate

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
						• V Block (magnetic) • Height Gauge • Straight Edge & Squares • Abrasive Cutter for Samples • Polishing machine • HNo3 Acid for Penetration check • Hardness Tester • Sample parts from small to big for practicing welding in various thickness • Goggles • Protective Gloves • Shields • Ear Plugs • Aprons • Safety Shoes • Fire Fighting Equipment • First Aid Box • Maintenance Mannuals and Welding handbooks • Necessary spares of machines voltage & current meters • Standards for weldings symbols • Standards of GD & T BIS, ASME & ASTM • Welding Simulators
4.	Support the welder in the welding process	35.00	50.00	• Install the work pieces on the welding apparatus keeping in mind the electrode distance, contact area, pressure, temperature, application as per welding SOP/control plan • Check the operation of core welding equipment like welding gun, transformers, gas discharge units as per set up documentation • Support the operator in	ASC/N 3105	• Different types of joints • Bench Drill • Drills & Taps • Bench Grinder • AC/DC Arc welder • Electrode Holder • Electrodes (M.S) • Welding booth with Exhaust (3' x 2.5' x 3.5') • Metal Inert Gas welding (MIG) Set (Single phase) • Wire feeder and Roll • Co2 gas cylinder + Regulator + gas heater &

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
				conducting destructive and non destructive test. • Help welder in monitoring process parameters like gas discharge flow, electrode force, electrode distance by reading various meters to prevent any harm on work pieces. • Measure final welding pieces & compare the dimension as given in the work order engineering drawing • In case part is not as per drawing, remove extra material by using chippers, grinders, etc		flow meter • Torch with Nozzle • Tungsten Innert gas Welding (TIG) set with Electrode • Argon gas cylinder • Hammer/Chipping • Wire Brush • Spot/Projection Welding machine with tips • Equipment for Brazing and Soldering • Tool Box with different sizes of Round & open end spanners • Hydraulic & lubricating oil • Consumables like electrodes gas cylinder & similar item • Fixtures for holding components • Defective & good samples of weld • Control plan, operation std & work Instructions • Vernier • Micrometer • Surface plate • V Block (magnetic) • Height Gauge • Straight Edge & Squares • Abrasive Cutter for Samples • Polishing machine • HNo_3 Acid for Penetration check • Hardness Tester • Sample parts from small to big for practicing welding in various thickness • Goggles • Protective Gloves • Shields

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
						• Ear Plugs • Aprons • Safety Shoes • Fire Fighting Equipment • First Aid Box • Maintenance Mannuals and Welding handbooks • Necessary spares of machines voltage & current meters • Standards for weldings symbols • Standards of GD & T BIS, ASME & ASTM • Welding Simulators
5.	**Remove the finished goods and store them in the designated place**	15.00	30.00	• Understand the output product shape and decide the suitable mechanism to lift the output • Clamp the product and lift the output using suitable equipment like hoist, life, trolley • Ensure there is no damage to the lifted work piece • Identify by tag the right quality pieces.	ASC/N 3106	• Different types of joints • Bench Drill • Drills & Taps • Bench Grinder • AC/DC Arc welder • Electrode Holder • Electrodes (M.S) • Welding booth with Exhaust (3' x 2.5' x 3.5') • Metal Inert Gas welding (MIG) Set (Single phase) • Wire feeder and Roll • Co2 gas cylinder + Regulator + gas heater & flow meter • Torch with Nozzle • Tungsten Innert gas Welding (TIG) set with Electrode • Argon gas cylinder • Hammer/Chipping • Wire Brush • Spot/Projection Welding machine with tips • Equipment for Brazing and Soldering • Tool Box with different sizes of Round & open end spanners • Hydraulic & lubricating oil

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
						• Consummables like electrodes gas cylinder & similar item • Fixtures for holding components • Defective & good samples of weld • Control plan, operation std & work Instructions • Vernier • Micrometer • Surface plate • V Block (magnetic) • Height Gauge • Straight Edge & Squares • Abrasive Cutter for Samples • Polishing machine • HNo3 Acid for Penetration check • Hardness Tester • Sample parts from small to big for practicing welding in various thickness • Goggles • Protective Gloves • Shields • Ear Plugs • Aprons • Safety Shoes • Fire Fighting Equipment • First Aid Box • Maintenance Mannuals and Welding handbooks • Necessary spares of machines voltage & current meters • Standards for weldings symbols • Standards of GD & T BIS, ASME & ASTM • Welding Simulators

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
6.	Conduct quality checks and inspection of the finished metal cast products	10.00	20.00	• Measure the specifications of the finished product using devices like micrometers, vernier calipers, gauges, rulers, weighing scales and any other inspection equipment and compare with the parameters given in the work order • Compare texture, color, surface properties, hardness and strength with the given product specifications • Note down the observations of the basic inspection process and identify pieces which are OK and also not meeting the specified standards • Separate the defective pieces into two categories – pieces which can be repaired/ modified and pieces which are beyond repair • Discard the pieces which are beyond repair and repair the ones which need minor modifications/ rework • Maintain records of each category of work outputs • Rectify minor defects like excess slag, shape deformation, sharp edges, rough surfaces, grooves, holes etc. by Fettling, chipping, Cutting, sawing, filling, shearing, hammering etc. • Escalate all issues related to change in colour, surface properties, hardness etc. so that the manufacturing equipment can be reset to achieve the specified output	ASC/N 0007	• Different types of joints • Bench Drill • Drills & Taps • Bench Grinder • AC/DC Arc welder • Electrode Holder • Electrodes (M.S) • Welding booth with Exhaust (3' x 2.5' x 3.5') • Metal Inert Gas welding (MIG) Set (Single phase) • Wire feeder and Roll • Co2 gas cylinder + Regulator + gas heater & flow meter • Torch with Nozzle • Tungsten Innert gas Welding (TIG) set with Electrode • Argon gas cylinder • Hammer/Chipping • Wire Brush • Spot/Projection Welding machine with tips • Equipment for Brazing and Soldering • Tool Box with different sizes of Round & open end spanners • Hydraulic & lubricating oil • Consummables like electrodes gas cylinder & similar item • Fixtures for holding components • Defective & good samples of weld • Control plan, operation std & work Instructions • Vernier • Micrometer • Surface plate • V Block (magnetic) • Height Gauge • Straight Edge & Squares

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
						• Abrasive Cutter for Samples • Polishing machine • HNo3 Acid for Penetration check • Hardness Tester • Sample parts from small to big for practicing welding in various thickness • Goggles • Protective Gloves • Shields • Ear Plugs • Aprons • Safety Shoes • Fire Fighting Equipment • First Aid Box • Maintenance Mannuals and Welding handbooks • Necessary spares of machines voltage & current meters • Standards for weldings symbols • Standards of GD & T BIS, ASME & ASTM • Welding Simulators
7.	Inspect and maintain the product quality	32	50	• Conduct an inspection of a part covering the following check points • Visual inspection of the part for scratches, dents, damages, packing as per the norm set • Conduct complete dimensional/layout inspection as per drawing • Note down the observations of basic inspection process and identify ok & not meeting	ASC/N 6301	• Sample of Rejected parts for defects like dent, scratch, damage and burrs • Packaging standards with visual aids • List of approved labs (NABL accredited) for outsourced testing • Stickers & labels for ok, reject and Hold materials • Formats for

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
				specification parts a) Separate the defective parts into two categories 1. Parts which can be repaired/modified and pieces which are beyond repair. 2. Discard the pieces which are beyond repair and repair the pcs with minor defects, maintain record of each category. • Coordination with the respective process owners/seniors in QA and implement CAPA for discrepancies in the parameters identified in the report on immediate basis. • Participate in checking effectiveness of implementation and report the process till the discrepancies are resolved. • Document the observation of the inspection & maintain records		dimensional, material & function testing of parts • Min sample of 30 parts produced in one setting for conducting CP/CPK study (can be any category of parts) • Operating manuals of precision instruments • Personnel protection equipment-gloves, safety shoes, goggles, ear plugs, workshop safety, fire extinguisher, first aid, safety signs, SOP chart on safety norms, charts of Do's & don't • Handbooks & tech reference books
8.	Conduct regular cleaning and maintenance of the equipment	10.00	20.00	• Arrange all equipment in a proper order as indicated in the equipment manual • Store equipment auxiliaries and spare parts in proper designated areas • tag process related equipment parts/ spare parts as per part number or serial number so that sorting of equipment becomes easy • Check the working of all	ASC/N 0008	• Different types of joints • Bench Drill • Drills & Taps • Bench Grinder • AC/DC Arc welder • Electrode Holder • Electrodes (M.S) • Welding booth with Exhaust (3' x 2.5' x 3.5') • Metal Inert Gas welding (MIG) Set (Single phase)

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
				bearing, rollers, shafts etc. and oil all moving parts of the equipment on a periodic basis • Check the working of non-moving parts and periodically conduct preventive maintenance to prevent machine failure • Periodically check the equipment calibration and report any errors to the maintenance teams for rectification • Prepare periodic log sheets of equipment maintenance dates,maintenance schedules and maintenance activity conducted on the equipment		• Wire feeder and Roll • Co2 gas cylinder + Regulator + gas heater & flow meter • Torch with Nozzle • Tungsten Innert gas Welding (TIG) set with Electrode • Argon gas cylinder • Hammer/Chipping • Wire Brush • Spot/Projection Welding machine with tips • Equipment for Brazing and Soldering • Tool Box with different sizes of Round & open end spanners • Hydraulic & lubricating oil • Consummables like electrodes gas cylinder & similar item • Fixtures for holding components • Defective & good samples of weld • Control plan, operation std & work Instructions • Vernier • Micrometer • Surface plate • V Block (magnetic) • Height Gauge • Straight Edge & Squares • Abrasive Cutter for Samples • Polishing machine • HNo3 Acid for Penetration check • Hardness Tester • Sample parts from small to big for practicing welding in various thickness • Goggles

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
						• Protective Gloves • Shields • Ear Plugs • Aprons • Safety Shoes • Fire Fighting Equipment • First Aid Box • Maintenance Mannuals and Welding handbooks • Necessary spares of machines voltage & current meters • Standards for weldings symbols • Standards of GD & T BIS, ASME & ASTM • Welding Simulators
9.	Maintain a safe and healthy working environment	10.00	15.00	• Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise • Create awareness amongst other by sharing information on the identified risks • Operate the machine using the recommended Personal Protective Equipment (PPE) • Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc. • Maintain high standards of personal hygiene at the work place • Ensure that the waste disposal is done in the designated area and manner as per organization SOP.	ASC/N 0006	• Teaching Aids: Charts, CBTs, Videos, White board Markers, White board / Flip charts. • Personal Protection Equipment: Gloves, Safety Shoes, goggles, ear plugs, • Workshop Safety: Fire extinguishers • First Aid • Safety signs • SOP Charts on safety norms and drills • Charts of dos and Don'ts in work area. • Standards, procedures and policies related to Health, Safety and Environment followed in companies
10.	Maintain 5S at the work premises	20.00	45.00	• Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use	ASC/N 0021	• Tools, fixtures & jigs • Personal Protection Equipment: Gloves, Safety Shoes, goggles, ear plugs

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
				and un-necessary items are not cluttering the work benches or work surfaces. • Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions • Segregate the items which are labeled as red tag items for the process area and keep them in the correct places • Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required • Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions • Ensure that the area has floors swept, machinery clean and generally clean. In case of cleaning, ensure that proper displays are maintained on the floor which indicate potential safety hazards • Ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene • Participate actively in employee work groups on 5S and encourage team members for active participation		• SOP document and charts on segregation and disposal of waste • SOP on health safety and environment • Safety sign boards/signs • Risk mitigation plan • SOP on safety and fire drills • Bins, containers, drums, trays, cabinets, lockers, boxes etc • Cleaning material and equipment • Sample fluids, oils, lubricants, solvents, chemicals tools/ equipment/ fasteners/ spare parts
	Total Duration:	175	300	**Unique Equipment Required:** • Class Room Size • Chairs/Tables • Computer with Internet • LCD Projector with Screen • Trainer chair and table • Demonstration table		

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
				• Pin up boards • White Board with Marker • Work table with Bench Vice • Different types of joints • Bench Drill • Drills & Taps • Bench Grinder • AC/DC Arc welder • Electrode Holder • Electrodes (M.S) • Welding booth with Exhaust (3'x 2.5'x 3.5') • Metal Inert Gas welding (MIG) Set (Single phase) • Wire feeder and Roll • Co2 gas cylinder + Regulator + gas heater & flow meter • Torch with Nozzle • Tungsten Innert gas Welding (TIG) set with Electrode • Argon gas cylinder • Hammer/Chipping • Wire Brush • Spot/Projection Welding machine with tips • Equipment for Brazing and Soldering • Tool Box with different sizes of Round & open end spanners • Hydraulic & lubricating oil • Consummables like electrodes gas cylinder & similar item • Fixtures for holding components • Defective & good samples of weld • Control plan, operation std & work Instructions • Vernier • Micrometer • Surface plate • V Block (magnetic) • Height Gauge • Straight Edge & Squares • Abrasive Cutter for Samples • Polishing machine • HNo3 Acid for Penetration check • Hardness Tester • Sample parts from small to big for practicing welding in various thickness • Goggles		

Sr. No.	Module	Theory Duration (hh:mm)	Practical Duration (hh:mm)	Key Learning Outcomes	Corresponding NOS Code	Equipment Required
				• Protective Gloves • Shields • Ear Plugs • Aprons • Safety Shoes • Fire Fighting Equipment • First Aid Box • Maintenance Mannuals and Welding handbooks • Necessary spares of machines voltage & current meters • Standards for weldings symbols • Standards of GD & T BIS, ASME & ASTM • Welding Simulators • Sample of Rejected parts for defects like dent, scratch, damage and burrs • Packaging standards with visual aids • List of approved labs (NABL accredited) for outsourced testing • Stickers & labels for ok, reject and Hold materials • Formats for dimensional, material & function testing of parts • Min sample of 30 parts produced in one setting for conducting CP/CPK study (can be any category of parts) • Operating manuals of precision instruments • Personnel protection equipment-gloves, safety shoes, goggles, ear plugs, workshop safety, fire extinguisher, first aid, safety signs, SOP chart on safety norms, charts of Do's & don't • Handbooks & tech reference books		

Grand Total Course Duration: 475 Hours 0 Minutes

(This syllabus/ curriculum has been approved by ***(Automotive Skill development Council)*** *(name of relevant Sector Skill Council or NSDC designated authority)*

Trainer Prerequisites for Job role: "Welding and Quality Technician" mapped to Qualification Pack: ASC/Q 3109 Version 1.0

Sr. No.	Area	Details
1	**Description**	Welding and Quality Technician level 3 is often called as assistant welder. The role is responsible for supporting the welder /operator in joining various type of metallic frames structure jigs, plates, sheet etc using heating and melting process create through electric power and gaseous discharge and inspection activities.
2	**Personal Attributes**	Technical knowledge of welding metallurgy inspection. The individual should have the ability of operation monitoring i.e., observing gauges, dials etc. maintaining arm steadiness, ability to quickly move hand to grasp and assemble objects (D exterity), reading, writing abd communication skills and sensitivity towards safety for self and equipment.
3	**Minimum Educational Qualifications**	ITI Diploma
4a	**Domain Certification**	Certified for Job Role: "Welding and Quality Technician" mapped to QP: "ASC/Q 3102and ASC/Q 6301".Minimum accepted score-75%, as per ASDC guidelines.
4b	**Platform Certification**	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "SSC/1402". Minimum accepted score-75%, as per ASDC guidelines.
5	**Experience**	▪ Minimum 2 years' experience in the Quality Department/welding of a Manufacturing Organization

Annexure: Assessment Criteria

Assessment Criteria for Welding and Quality Technician	
Job Role	Welding and Quality Technician
Qualification Pack	ASC/Q3109, Version 1.0
Sector Skill Council	Automotive Skills Development Council

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training canter based on this criteria.
5	To pass the Qualification Pack, every trainee should score a minimum of 60% in aggregate and 40% in each NOS.
6	The marks are allocated PC wise; however, every NOS will carry a weight age in the total marks allocated to the specific QP.

Sr. No.	NOS No.	NOS Name	Marks Allocation			
			Total Marks	Out OF	Theory	Practical Skills
1	**ASC/N3103 Understand welding job requirements and related processes**	PC1.understand the work order (work output) required from the process and discuss the same with the operator	100	17	4	13
		PC2.refer all engineering drawings and sketches related to the work output to understand the measurement and shape of the required work output		17	4	13
		PC3.clearly understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors		16	4	12
		PC4.refer the queries to the Operator/ Welder if they cannot be resolved by the Assistant Welder on own		16	4	12
		PC5.obtain help or advice from specialist if the problem is outside his/her area of competence or experience		17	4	13
		PC6.confirm self - understanding to the Operator once the query is resolved so that all doubts & queries can be resolved before the actual process execution		17	5	12
			Total	**100**	**25**	**75**
2	**ASC/N3104 Prepare the welding machine for the welding process**	PC1.understand the right welding methodology and process to be adopted for completing the work order from the supervisor	100	8	2	6
		PC2.understand the various welding parameters		8	2	6

Sr. No.	NOS No.	NOS Name	Marks Allocation			
			Total Marks	Out OF	Theory	Practical Skills
		like temperature, pressure, electrode type, electrode distance (gap), Welding current, voltage, process time etc. before starting the welding process				
		PC3.understand the material required and the equipment availability for executing the activity		7	2	5
		PC4.correctly understand the type of electrode in terms of electrode material and thickness, filler material and flux which will be required for the selected welding process before the initiation of the welding process		8	2	6
		PC5.ensure that the required material is procured from the store before starting the welding process		6	1	5
		PC6.along with the helper, clean the surface of the electrodes and the welding gun to remove dust and any other impurities		6	1	5
		PC7.clean other welding machine auxiliaries(Welding Transformer, Gas Discharge unit, Flux wire) before the initiation of the welding process		7	2	5
		PC8.setup the welding apparatus as per the selected welding process and the internal Operating procedures and the setting standards for the machine		8	2	6
		PC9.clean the surface to the metal parts (work pieces) which need to be joint		6	1	5
		PC10.remove any extra material, sharp edges etc. which might impact the final welded product		7	2	5
		PC11.correctly compare the dimensions of the work pieces available on the welding line with the		8	2	6

Sr. No.	NOS No.	NOS Name	Marks Allocation			
			Total Marks	Out OF	Theory	Practical Skills
		product drawing/ sketches available with the operator				
		PC12.in case the parts are not as per the given measurements, remove extra material by using chippers, grinders etc.		7	2	5
		PC13.immediately refer the queries to a operator and the supervisor		7	2	5
		PC14.confirm self-understanding to the operator once the query is resolved so that all doubts & queries can be resolved before the actual process execution		7	2	5
			Total	**100**	**25**	**75**
3	**ASC/N3105 Support the welder in the welding process**	PC1.hold the parts which need to be welded together using a clamp and align them with the electrodes as per the job requirement so that the work pieces do not fall down/ turn	100	11	2	9
		PC2.install the work pieces on the Welding apparatus keeping in mind the electrodes distance, contact area, pressure, temperature application etc. as specified in the Welding SOP/ Control plan Documents/Work Instructions and instructed by the operator/ welder and the supervisor		11	3	8
		PC3.check for operation of core welding equipment like welding gun, welding transformer, gas cylinders, gas discharge units as per setup documentation		9	2	7
		PC4.support the operator in conducting destructive and non-destructive test activity		9	2	7
		PC5.support the operator in the Gas Discharge welding by holding the Welding Gun and the Filler		9	2	7

Sr. No.	NOS No.	NOS Name	Marks Allocation			
			Total Marks	Out OF	Theory	Practical Skills
		material/ Gas discharge				
		PC6.help the welder in monitoring the welding process (Pressure, Temperature, gas discharge flow, electrode force, electrode distance etc.) by observing and communicating the readings on various panels/ meters at the right time to prevent any harm to the work pieces due to overheating, burning, over melting		10	2	8
		PC7.measure the final welded piece and compare the dimensions as prescribed in the work order engineering drawing		11	3	8
		PC8.in case the parts are not as per the given measurements, remove extra material by using chippers, grinders etc.		10	3	7
		PC9.if there are any bulges, then hammer the bulges and give the work pieces the desired shape		10	3	7
		PC10.keep the operator informed of any inconsistency in the welding process, quality issues etc. so that the same can be dealt immediately		10	3	7
			Total	**100**	**25**	**75**
4	**ASC/N3106 Remove the finished goods and store them in the designated place**	PC1.understand the output product shape and decide the mechanism to lift the output	100	15	4	11
		PC2.clamp the product and lift the output object using suitable equipment like hoist, lifts, crane etc.		14	4	10
		PC3.ensure that there is no damage to the lifted work pieces		14	3	11
		PC4.carry the output product to the designated area using hangars, conveyor belts, cranes, forklifts		14	3	11

Sr. No.	NOS No.	NOS Name	Marks Allocation			
			Total Marks	Out OF	Theory	Practical Skills
		etc.				
		PC5.post inspection process, tag the right quality pieces for future identification		14	4	10
		PC6.carry the tagged pieces to the storage areas using manual/ automatic means		15	4	11
		PC7.keep a record of the finished goods along with the storage identification numbers for easy sorting		14	3	11
			Total	**100**	**25**	**75**
5	**ASC/N6301 Inspect and maintain the product quality**	PC1.conduct the process of Inspection at the stages: •complete dimensional /Layout Inspection at development stage & later as per the periodicity such as annual for re- validation •in the Production phase as per the CP/ Quality plan/ sampling Plan/ stage inspection plans/ First off IR	100	6	2	4
		PC2.handle Inspection equipment and Instruments such as •vernier, micrometers •height Gauge & surface plate •acceptance/ Combination Gauges •simple gauges – bore, air , profile for safe storage, calibration at pre-decided frequency and have an acceptable level of R & R as per SOP of the organization		6	2	4
		PC3.conduct a inspection of the product covering the following checkpoints: •visual Inspection of the part for scratches, dents , damages, packing as per the norms etc. •special inspection co-ordinate with other agencies e.g. Lab :Material, Lab: Standards Room, assembly		6	2	4

Sr. No.	NOS No.	NOS Name	Marks Allocation			
			Total Marks	Out OF	Theory	Practical Skills
		/ performance trials etc. •identification sticker/number/label placed on the product •functioning of the product and its components •documentation pertaining to the Quality				
		PC4.coordinate with the respective process owners / seniors in QA and implement CAPA for discrepancies in the parameters identified in the report on immediate basis		6	2	4
		PC5.participate in checking the effectiveness of implementation and repeat the process till the discrepancies are resolved		5	1	4
		PC6.document the observations of the inspection and maintain records of		5	1	4
		PC7.IR, ERP-System record and special process capability index calculation/charting as per the SOP raise a scrap note and dispose off the scrapped product in the scrap yard as per the defined procedure maintaining the HSE compliance		6	1	5
		PC8. as is the case i.e. New product/process development / Production phase, the reports and Part Submission Warrant, PPAP are to be prepared.		5	1	4
		PC9.based on the implementation of information flow system in organization like ERP/SAP, upload the reports		6	1	5
		PC10.conduct a dock audit of a sample batch from the production lot of the ready to dispatch final products covering the following checkpoints: •product in good shape with no visible damage •presence of sharp edges in the product		6	2	4

Sr. No.	NOS No.	NOS Name	Marks Allocation			
			Total Marks	Out OF	Theory	Practical Skills
		•wear and tear of the product •presence of any physical defects •packaging of product according to customer specification •packaging boxes as per the requirement for preservation •customer PO Number on the shipping labels •boxes labeled correctly with packer name •count on the Bill of Lading match the count on the pallet •boxes stacked neatly in case of pallet arrangement •Damages of the pallet like nails sticking out, broken boards, etc.				
		PC11.coordinate with the respective process owners/Stores and implement CAPA for discrepancies identified in the dock audit on immediate basis		5	1	4
		PC12.review the effectiveness of implementation and repeat the process till the discrepancies are resolved		5	1	4
		PC13.document the observations of dock audit and maintain records		5	1	4
		PC14.based on the implementation of information flow system in organization like ERP/SAP, upload the reports		6	2	4
		PC15.work as a CFT member of the team formed for solving a problem pertaining to the products handled .Collect data regarding the problem as decided in the team discussions		6	1	5
		PC16.participate for preparation of Fault tree, conducting simulation and implementation of		5	1	4

Sr. No.	NOS No.	NOS Name	Marks Allocation			
			Total Marks	Out OF	Theory	Practical Skills
		actions				
		PC17.participate for updating relevant documentation		5	1	4
		PC18.assist the NPD department in efficient development of the new product by sharing all the problems related to QCD observed in the existing products		6	2	4
			Total	**100**	**25**	**75**
6	**ASC/Nooo6 Maintain a safe and healthy working environment**	PC1.follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and un-necessary items are not cluttering the workbenches or work surfaces	100	4	1	3
		PC2.ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions		4	1	3
		PC3.follow the technique of waste disposal and waste storage in the proper bins as per SOP		4	1	3
		PC4.segregate the items which are labeled as red tag items for the process area and keep them in the correct places		4	1	3
		PC5.sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions		4	1	3
		PC6.ensure that areas of material storage areas are not overflowing		3	1	2
		PC7.properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when		4	1	3

Sr. No.	NOS No.	NOS Name	Marks Allocation			
			Total Marks	Out OF	Theory	Practical Skills
		required				
		PC8.return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area		4	1	3
		PC9.follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards		4	1	3
		PC10.follow the proper labeling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists		4	1	3
		PC11.check that the items in the respective areas have been identified as broken or damaged		3	0	3
		PC12.follow the given instructions and check for labeling of fluids, oils. lubricants, solvents, chemicals etc. and proper storage of the same to avoid spillage, leakage, fire etc.		4	1	3
		PC13.make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions		4	1	3
		PC14.check whether safety glasses are clean and in good condition		3	1	2
		PC15.keep all outside surfaces of recycling containers are clean		3	1	2
		PC16.ensure that the area has floors swept, machinery clean and generally clean. In case of cleaning, ensure that proper displays are maintained on the floor which indicate potential safety hazards		4	1	3

Sr. No.	NOS No.	NOS Name	Marks Allocation			
			Total Marks	Out OF	Theory	Practical Skills
		PC17.check whether all hoses, cabling & wires are clean, in good condition and clamped to avoid any mishap or mix up		4	1	3
		PC18.ensure workbenches and work surfaces are clean and in good condition		3	1	2
		PC19.follow the cleaning schedule for the lighting system to ensure proper illumination		4	1	3
		PC20.store the cleaning material and equipment in the correct location and in good condition		4	1	3
		PC21.ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene		4	1	3
		PC22.follow the daily cleaning standards and schedules to create a clean working environment		4	1	3
		PC23.attend all training programs for employees on 5 S		4	1	3
		PC24.support the team during the audit of 5 S		4	1	3
		PC25.participate actively in employee work groups on 5S and encourage team members for active participation		5	1	4
		PC26.follow the guidelines for What to do and What not to do to build sustainability in 5S as mentioned in the 5S check lists/ work instructions		4	1	3
			Total	**100**	**25**	**75**
7	**ASC/N0007 Conduct quality checks and inspection of the finished**	PC1.measure the specifications of the finished product using devices like micrometers, vernier calipers, gauges, rulers, weighing scales and any other inspection equipment and compare with the parameters given in the work order	100	17	4	13

Sr. No.	NOS No.	NOS Name	Marks Allocation			
			Total Marks	Out OF	Theory	Practical Skills
	metal cast products					
		PC2.compare texture, color, surface properties, hardness and strength with the given product specifications		17	4	13
		PC3.note down the observations of the basic inspection process and identify pieces which are OK and also not meeting the specified standards		17	4	13
		PC4.separate the defective pieces into two categories – pieces which can be repaired/ modified and pieces which are beyond repair		16	4	12
		PC5.discard the pieces which are beyond repair and repair the ones which need minor modifications/ rework		17	5	12
		PC6.maintain records of each category of work outputs		16	4	12
			TOTAL	**100**	**25**	**75**
8	**ASC/Nooo8 Conduct regular cleaning and maintenance of the equipment**	PC1.arrange all equipment in a proper order as indicated in the equipment manual	100	9	2	7
		PC2.store equipment auxiliaries and spare parts in proper designated Areas		9	2	7
		PC3.clearly tag process related equipment parts/ spare parts as per part number or serial number so that sorting of equipment becomes easy		9	2	7
		PC4.cover equipment so that there is limited dust collection and moisture contact		9	2	7
		PC5.regularly clean the equipment and process auxiliaries to remove any dust, moisture, waste material which would have got collected on the		9	3	6

Sr. No.	NOS No.	NOS Name	Marks Allocation			
			Total Marks	Out OF	Theory	Practical Skills
		equipment				
		PC6.regularly open the equipment and clean the internal parts of the Equipment		9	3	6
		PC7.regularly clean the working area under the process and create a healthy, clean and safe working environment		9	3	6
		PC8.check the working of all bearing, rollers, shafts etc. and oil all moving parts of the equipment on a periodic basis		9	2	7
		PC9.check the working of non-moving parts and periodically conduct preventive maintenance to prevent machine failure		9	2	7
		PC10.periodically check the equipment calibration and report any errors to the maintenance teams for rectification		9	2	7
		PC11.prepare periodic log sheets of equipment maintenance dates, maintenance schedules and maintenance activity conducted on the equipment		10	2	8
			Total	**100**	**25**	**75**
9	**ASC/N0021 Maintain 5S at the work premises**	PC1.identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise	100	9	2	7
		PC2.inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc		9	2	7
		PC3.inform the concerned authorities about damages which can potentially harm man/		9	2	7

Sr. No.	NOS No.	NOS Name	Marks Allocation			
			Total Marks	Out OF	Theory	Practical Skills
		machine during operations				
		PC4.create awareness amongst other by sharing information on the identified risks		9	2	7
		PC5.follow the instructions given on the equipment manual describing the operating process of the equipments		9	3	6
		PC6.follow the Safety, Health and Environment related practices developed by the organization		9	3	6
		PC7.operate the machine using the recommended Personal Protective Equipments (PPE)		10	3	7
		PC8.maintain a clean and safe working environment near the workplace and ensure there is no spillage of chemicals, production waste, oil, solvents etc		9	2	7
		PC9.maintain high standards of personal hygiene at the work place		9	2	7
		PC10.ensure that the waste disposal takes place in the designated area as per organization SOP		9	2	7
		PC11.inform appropriately the medical officer/ HR in case of self or an employee's illness of contagious nature so that preventive actions can be planned for others		9	2	7
			Total	**100**	**25**	**75**