Model Curriculum

QC Inspector Level 4

SECTOR: AUTOMOTIVE
SUB-SECTOR: MANUFACTURING SUPPORT
OCCUPATION: QUALITY ASSURANCE
REF ID: ASC/Q6303, VERSION 1.0
NSQF LEVEL: 4

Skill India

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 "QC Inspector Level 4" QP No: "ASC/Q6303, NSQF Level 4"

Date of Issuance: January 10th, 2018

Valid up to: January 10th, 2020*

*Valid up to the next review date of the Qualification Pack

Authorised Signatory
(Automotive Skills Development Council)

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QC Inspector Level 4

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a "**QC Inspector Level 4**", in the "**Automotive**" Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	**QC Inspector L4**		
Qualification Pack Code	ASC/Q6303, v1.0		
Version No.	1.0	**Version Update Date**	10th April 2019
Pre-requisites to Training	ITI in Mechanical/Electrical/Electronic Engineering (Product content based)		
Training Outcomes	**After completing this programme, participants will be able to:** • Inspect and maintain the product quality and implement corrective action. • Maintain a safe and healthy work place by adhering to the safety guidelines in the working area of the organization and follow the practices which are not impacting the environment in a negative manner. • Ensure all 5S activity both at the shop floor and the office area to facilitate increase in work production.		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of "QC Inspector Level 4" Qualification Pack issued by "Automotive Skills Development Council".

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	**Introduction** **Theory Duration** (hh:mm) 10:00 **Practical Duration** (hh:mm) 00.00 **Corresponding NOS Code** Bridge Module	• List various auto manufacturers • Discuss terms associated with the sector • List job opportunities as QC Inspector • List role and responsibilities of a QC Inspector	
2	**Inspect the product quality** **Theory Duration** (hh:mm) 45:00 **Practical Duration** (hh:mm) 95.00 **Corresponding NOS Code** ASC/N6303	• Demonstrate process of inspection at different stages. • Demonstrate use of inspection equipment and instrument such as Vernier micrometres, height gauge & surface plate, slip gauge, combination gauges, gauges- Bore, Air, Profile, Dial, instrument / equipment such as surface roughness tester, roundness etc. and coordinate measurement machine (CMM). • Carryout preservation of samples such as master sample for PPAP, inspected batch sample and reference sample for the defect library for monitoring product quality. • Demonstrate inspection process of the product covering the checkpoints such as part for scratches, dents, damages, packing as per the norms etc., identification sticker/number/label placed on the product and functioning of the products and its components. • Prepare inspection reports and relevant documents. • Prepare records in IR, ERP system. • Prepare capability index calculation/ charting as per the SOP. • Conduct audit of production line for First Off Inspection report, CP for coverage of parameters, stage inspection & Process capability charts etc. • Follow organization policies and procedures for storage and preservation of materials.	• Sample Parts used in Automotive applicant • Vernier calliper, micrometer, height gauge, surface plate, slip gauges, combination gauges, • Gauges – Bore, Air, Profile, Dial • Equipment such as surface roughness tester, roundness etc. • Co-ordinate measurement machine (CMM). • Centre Bench • Defective Samples Preferably with Dent, Scratches, Rust, Sharp Burrs • Labels, Stickers, Sample Insp Report Format • Limit Samples for Visual Defects • Manuals for SPC, APQP, MSA TS Standard Manual. • Gloves, Apron, Safety Shoes

Sr. No.	Module	Key Learning Outcomes	Equipment Required
3	**Maintain the product quality** **Theory Duration** (hh:mm) 40:00 **Practical Duration** (hh:mm) 80.00 **Corresponding NOS Code** ASC/N6303	• Follow TS-16949/any other QMS system guidelines followed in the organization. • Describe New Development Product (NPD), Dock Audit, process. • Describe APQP, PFMEA CP process and its application. • Demonstrate process of disposing the scrapped the product in the scrap yard. • Describe problem solving & analysis tools like 8Ds, five why analysis etc. • Implement problem solving & analysis tools for collecting data regarding the problem. • Describe RCA analysis techniques. • Implement CAPA for discrepancies in the parameters identified in the IR. • Explain Calibration system for instrument and gauges and be able to conduct R+R study. • Explain function of parts and aggregates.	• Sample Parts used in Automotive applicant • Vernier calliper, micrometer, height gauge, surface plate, slip gauges, combination gauges, • Gauges – Bore, Air, Profile, Dial • Equipment such as surface roughness tester, roundness etc. • Co-ordinate measurement machine (CMM). • Centre Bench • Defective Samples Preferably with Dent, Scratches, Rust, Sharp Burrs • Labels, Stickers, Sample Insp Report Format • Limit Samples for Visual Defects • Manuals for SPC, APQP, MSA TS Standard Manual. • Gloves, Apron, Safety Shoes
4	**Maintain a safe, clean and healthy working environment** **Theory Duration** (hh:mm) 30:00 **Practical Duration** (hh:mm) 40:00 **Corresponding NOS Code** ASC/N0006	• List workplace hazards and risks • Use personal protective equipment like safety gloves, safety glasses, safety shoes and safety helmet at workplace. • Identify activities which can cause potential injury • Report concerned authorities about the potential risks • Report concerned authorities about machine breakdowns, damages • Support the safety team and the supervisor in creating the risk mitigation plan • Follow the instructions given in the equipment manual • Follow the safety, health and environment related practices • Follow safety signs placed on the shop floor • Demonstrate use of fire-fighting equipment • List the contents of first aid kit. • Maintain a clean and safe working environment • Attend all safety and fire drills to be self-aware of safety hazards and preventive techniques	Housekeeping material: Cleaning agents, Cleaning cloth, Waste container, Dust pan & brush set, Liquid soap, Hand towel, Fire extinguisher, **Safety Gears** Safety Shoes, Ear plug, goggles, Gloves, helmet, First Aid Kit

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		• Maintain high standards of personal hygiene at the work place • Follow organizational procedure of waste disposal • Report appropriately to medical officer/ HR in case of self or an employee's illness	
5	**Maintaining 5S at the work premises** **Theory Duration** (hh:mm) 25:00 **Practical Duration** (hh:mm) 35:00 **Corresponding NOS Code** ASC/N0021	• Examine that work area, tools, equipment and materials are clean • Maintain proper storage for the inventory, cleaning material and equipment. • Demonstrate personal hygiene and cleanliness at workplace. • Identify daily cleaning standards and schedules to create a clean working environment • Sort and label materials, tools and equipment's and spare parts while storing. • Segregate waste into hazardous and non-hazardous waste and dispose the waste as per SOP. • Follow 5S guidelines at workplace	5S Charts, Posters and literature
	Total Duration **Theory Duration** (hh:mm) 150:00 **Practical Duration** (hh:mm) 250:00	**Unique Equipment Required** • Sample Parts Applicable to Automotive application, Defective Samples Preferably with Dent, Scratches, Rust, Sharp Burrs, Limit Samples for Visual Defects • Vernier calliper, micrometer, height gauge, surface plate, slip gauges, combination gauges, standard pin set. • Gauges – Bore, Air, Profile, Dial • Equipment such as surface roughness tester, roundness profile projector. • Co-ordinate measurement machine (CMM). • Centre Bench, V Blocks, clamps, feeler group, • Labels, Stickers, Sample Inspection Report Format • Manuals for SPC, APQP, MSA TS Standard Manual. • **Safety Materials**: Fire extinguisher, Leather safety gloves, leather aprons, safety glasses, Ear Plug, Safety Shoe and First aid kit • **Cleaning material and other tools:** Wire brush (M.S.), Cleaning agents, Cleaning cloth, Waste container, Dust pan & brush set	

Grand Total Course Duration: **400 Hours, 0 Minutes**

*(This syllabus/ curriculum has been approved by **Automotive Skills Development Council)***

Trainer Prerequisites for Job role: "QC Inspector Level 4" mapped to Qualification Pack: "ASC/Q6303, Version 1.0"

S. No.	Area	Details
1	**Description**	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack "ASC/Q6303, Version 1.0".
2	**Personal Attributes**	• Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. • Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well organized and focused. • Eager to learn and keep oneself abreast of the latest developments and newer technologies used in the various systems of the vehicle and its aggregates is highly desirable. • Should be able to demonstrate the usage of workshop equipment, instruments, special instruments and tools. • Should have sharp diagnostic abilities for identifying reasons of problems in vehicles and troubleshoot. • Should be hands-on with quality control inspection practices to provide actual training.
3	**Minimum Educational Qualifications**	Diploma in Mechanical/Electrical/Electronic Engineering
4a	**Domain Certification**	Certified for Job Role: "QC Inspector Level 4" mapped to QP: ASC/Q6303, v1.0. Minimum qualifying score 80%, as per ASDC guidelines.
4b	**Platform Certification**	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/ Q2601". Minimum accepted score as per ASDC guidelines is 80%.
5	**Experience**	5 years for diploma holder

Annexure: Assessment Criteria

Assessment Criteria	
Job Role	**QC Inspector Level 4**
Qualification Pack	**ASC/Q6303, v1.0**
Sector Skill Council	**Automotive**

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. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.

4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).

4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion.

5. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.

6. In case of *unsuccessful completion*, the trainee may seek reassessment on the Qualification Pack.

Sr. No.	NOS No.	Compulsory NOS Name	Marks Allocation			
			Total Marks	Out of	Theory	Practical
1	**ASC/N6303 Inspect and maintain the product quality**	PC1. maintain and preserve following samples for monitoring product quality • master sample for PPAP • inspected batch samples • reference samples for the defect library	100	1	5	1
		PC2. 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.		2	4	2
		PC3. have an acceptable level of R & R for handling inspection equipment and instruments such as • vernier, micrometers		2	4	2

Sr. No.	NOS No.	Compulsory NOS Name	Marks Allocation			
			Total Marks	Out of	Theory	Practical
		• height Gauge & surface plate, slip gauges • Combination gauges • gauges – Bore, Air, Profile, Dial • instruments / equipment such as surface roughness tester, roundness etc. • co-ordinate measurement machine (CMM)				
		PC4. have an elementary understanding of Calibration system for the measuring instruments and ensure getting the equipment/ gauges etc calibrated with the support of QA Standards Room or external agency		1	4	1
		PC5. conduct an 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 using precision measuring equipment, performance trials etc. • identification sticker/ number/ label placed on the product • functioning of the product and its components • review material inspection report from the lab to verify acceptance • documentation pertaining to the Quality		2	4	2
		PC6. coordinate with the respective process owners / seniors in QA and implement CAPA for discrepancies in the parameters identified in the IR on immediate basis		2	4	2
		PC7. review the effectiveness of implementation and repeat the process till the discrepancies are resolved		1	4	1
		PC8. document the observations of the inspection and maintain records such as IR, ERP-System record and special process capability index calculation/charting as per the SOP		1	4	1
		PC9. raise a scrap note and dispose off the scrapped product in the scrap yard as per the defined procedure maintaining the HSE compliance as is the case i.e. New product/process development / Production phase, the reports and Part Submission Warrant, PPAP are to be prepared		1	5	1

Sr. No.	NOS No.	Compulsory NOS Name	Marks Allocation			
			Total Marks	Out of	Theory	Practical
		based on the implementation of information flow system in organization like ERP/SAP , upload the reports				
		PC10. First Off Inspection Report, CP for coverage of parameters		2	4	2
		PC11. stage Inspection & Process capability Charts		1	4	1
		PC12. availability of validated gauges		1	4	1
		PC13. R & R		1	4	1
		PC14. training of Production Technicians to the CP		2	4	2
		PC15. documentation formats				
		PC16. work as a CFT member of the team formed for PFMEA, CP & solving a problem pertaining to the products handled. Collect data regarding the problem as decided in the team discussions		1	5	1
		PC17. participate for preparation of Fault tree, conducting simulation and implementation of actions		1	4	1
		PC18. participate for updating relevant documentation		1	4	1
		PC19. assist the NPD department in efficient development of the new product by		2	4	2
		PC20. sharing all the problems related to QCD observed in the existing products		1	5	1
		PC21. identify opportunities for improvements in process based on trends or		2	4	2
		PC22. observations in PC - charts, tool Life, poka yoke, reduction in non-value added (NVA) activities & put these up for consideration to senior management		2	4	2
			Total	**100**	**25**	**75**
2	**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/ machine during operations		9	2	7

Sr. No.	NOS No.	Compulsory NOS Name	Marks Allocation			
			Total Marks	Out of	Theory	Practical
		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 equipment		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 Equipment (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**
3	**ASC/N0006 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 labelled 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		4	1	3

Sr. No.	NOS No.	Compulsory NOS Name	Marks Allocation			
			Total Marks	Out of	Theory	Practical
		size/ utility to avoid any fall of items/ breakage and also enable easy sorting when 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 labelling 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 labelling 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
		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

Sr. No.	NOS No.	Compulsory NOS Name	Marks Allocation			
			Total Marks	Out of	Theory	Practical
		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 5S		4	1	3
		PC24. support the team during the audit of 5S		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**
		Grand Total		**300**	**75**	**225**
		Percentage Weightage:			**25%**	**75%**
		Minimum Pass % to qualify (aggregate):			**80%**	