Model Curriculum

QP Name: Automotive Product Design Lead Engineer

QP Code: ASC/Q8102

QP Version: 2.0

NSQF Level: 6

Model Curriculum Version: 1.0

Automotive Skill Development Council, 153, Gr Floor, Okhla Industrial Area, Phase – III, Leela Building, New Delhi – 110020

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Training Parameters

Sector	Automotive
Sub-Sector	Research & Development
Occupation	Automotive Product Designing
Country	India
NSQF Level	6
Aligned to NCO/ISCO/ISIC Code	NCO-2015/2144.0803
Minimum Educational Qualification & Experience	3 years Diploma (Mechanical/ Automobile/ Electrical / Electronics) from recognized regulatory body with 3 years of relevant experience after class 12th OR B.E./B.Tech (Mechanical/Automobile / Electrical/ Electronics Engineering) with 1 Year of relevant experience, OR M.E./M.Tech (Mechanical/Automobile / Electrical/ Electronics Engineering)
Pre-Requisite License or Training	
Minimum Job Entry Age	23 Years
Last Reviewed On	30/09/2021
Next Review Date	30/09/2024
NSQC Approval Date	30/09/2021
Version	2.0
Model Curriculum Creation Date	30/09/2021
Model Curriculum Valid Up to Date	30/09/2024
Model Curriculum Version	1.0
Minimum Duration of the Course	570 Hours, 0 Minutes
Maximum Duration of the Course	570 Hours, 0 Minutes

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

After completing this programme, participants will be able to:

- Support the manager in fixing design and reliability parameters of the product by showing its requirements.
- Design vehicles using CAD along with ensuing design FMEA, human machine interface and telematics.
- Manage the product data and system integration mechanism
- Generate 3D printable file and optimum modelling curve from design & modelling software packages
- Select 3D printing machine for product generation as well as upload code files into it.
- Use 3D printing machine for the printing of automotive components.
- Work effectively and efficiently as per schedules and timelines.
- Implement safety practices.
- Use resources optimally to ensure less wastage and maximum conservation.
- Communicate effectively and develop interpersonal skills.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration	On-the-Job Training Duration	Total Duration
Bridge Module	**05:00**	**00:00**			**05:00**
Module 1: Introduction to the role of an Automotive Product Design Engineer	05:00	00:00			05:00
ASC/N9810: Manage work and resources (Manufacturing) **NOS Version No. – 1.0** **NSQF Level – 5**	**20:00**	**40:00**	-	-	**60:00**
Module 2: Manage work and resources according to safety and conservation standards	20:00	40:00	-	-	60:00
ASC/N9812 – Interact effectively with team, customers and others **NOS Version No. 1.0** **NSQF Level 5**	**20:00**	**35:00**	-	-	**55:00**

Module 3: Communicate effectively and efficiently	20:00	35:00	-	-	55:00
ASC/N8102: Explaining the product requirements, support the manager in finalizing the design specifications and reliability parameters of the product **NOS Version No. 2.0** **NSQF Level 6**	**30:00**	**60:00**	-	-	**90:00**
Module 4. Explaining the product requirements, support the manager in finalizing the design specifications and reliability parameters of the product.	30:00	60:00	-	-	90:00
ASC/N8103: Design vehicles & components using computer aided technology **NOS Version No. 2.0** **NSQF Level 6**	**30:00**	**90:00**	-	-	**120:00**
Module 5: Designing vehicles & components using CAD	30:00	90:00			120:00
ASC/N8104: Manage the product data and system integration mechanism **NOS Version No. 2.0** **NSQF Level 6**	**30:00**	**60:00**	-	-	**90:00**
Module 6: Managing the product data and system integration mechanism	30:00	60:00			90:00
ASC/N8108: Performing the component designing operation for 3D manufacturing machine. **NOS Version No. 2.0** **NSQF Level 6**	**20:00**	**40:00**	-	-	**60:00**
Module 7: Performing the component designing operation for 3D manufacturing machine	20:00	40:00			60:00
ASC/N6811: Select and operate 3D Printing	**30:00**	**60:00**	-	-	**90:00**

machine for product generation. **NOS Version No. 2.0** **NSQF Level 6**					
Module 8: Selecting and operating 3D Printing machine for product generation	30:00	60:00			90:00
Total Duration	**185:00**	**385:00**	-	-	**570:00**

Module Details

Module 1: Introduction to the role of an Automotive Product Design Engineer

Bridge module

Terminal Outcomes:

- Discuss the role and responsibilities of an Automotive Product Design Engineer.

Duration: *<05:00>*	**Duration**: *<00:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the role and responsibilities of an Automotive Product Design Engineer. • Discuss the job opportunities of an Automotive Product Design Engineer. • Explain about Indian automotive manufacturing market. • List various automobile Original Equipment Manufacturers (OEMs) and different products/ models manufactured by them. • Identify the standard checklists and schedules recommended by OEM. • Discuss the need and importance of computerised systems and updated softwares in Automotive manufacturing process.	
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
Checklist	

Module 2: Manage work and resources according to safety and conservation standards

Mapped to ASC/N9810, v1.0

Terminal Outcomes:

- Employ appropriate ways to maintain safe and secure working environment.
- Apply material and energy conservation practices at the workplace.

Duration: *<20:00>*	**Duration**: *<40:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss organisational procedures for health, safety and security and individual role and responsibilities related to the same. • List the potential workplace related risks, threats and hazards, their causes and preventions. • List personal protective equipment like safety gloves, glasses, shoes and mask used at the workplace. • List various types of fire extinguisher. • Identify various safety boards/ signs placed on the shop floor. • Explain 5S standards, procedures and policies followed at workplace. • Discuss organisational procedures to deal with emergencies and accidents at the workplace and importance of following them. • State the importance of conducting safety drills or training sessions. • Explain the process of filling daily check sheet for reporting to the concerned authorities about improvements done and risks identified. • Discuss how and when to report about potential hazards identified in the workplace and limits of responsibility for dealing with them. • Outline the importance of keeping workplace, equipment, restrooms etc. clean and sanitised. • Explain the importance of following hygiene and sanitation regulations developed by organisation at the workplace. • Discuss the importance of maintaining the availability of running water, hand wash and alcohol-based sanitizers at the workplace.	• Apply appropriate ways to implement safety practices to ensure safety of people at the workplace. • Display the correct way of wearing and disposing PPE. • Demonstrate the use of fire extinguisher. • Demonstrate how to provide first aid procedure in case of emergencies. • Demonstrate how to evacuate the workplace in case of an emergency. • Employ various techniques for checking malfunctions in the machines with the support of maintenance team and as per Standard Operating Procedures (SOP). • Demonstrate to arrange tools/ equipment/ fasteners/ spare parts into proper trays, cabinets, lockers as mentioned in the 5S guidelines/work instructions. • Apply appropriate ways to organise safety drills or training sessions for others on the identified risks and safety practices. • Prepare a report about the health, safety and security breaches. • Apply appropriate ways to check that workplace, equipment, restrooms etc. are cleaned and sanitised. • Role play a situation to brief the team about the hygiene and sanitation regulations developed by organisation. • Demonstrate the correct way of washing hands using soap and water and alcohol-based hand rubs. • Explain methods to support the employees to cope with stress, anxiety etc. • Demonstrate proper waste collection and disposal mechanism depending upon types of waste. • Perform the steps involved in storage of tools, equipment and material after completion of work.

• Discuss the significance of conforming to basic hygiene practices such as washing hands, using alcohol based hand sanitizers or soap. • Recall ways of reporting advanced hygiene and sanitation issues to the concerned authorities. • Elucidate various stress and anxiety management techniques and their. • Discuss the significance of greening. • Classify different categories of waste for the purpose of segregation. • Differentiate between recyclable and non-recyclable waste. • Discuss various methods of waste collection and disposal. • List the various materials used at the workplace. • Explain organisational recommended norms for storage of tools, equipment and material. • Discuss the importance of efficient utilisation of material and water. • Explain basics of electricity and prevalent energy efficient devices. • Explain the processes to optimize usage of material and energy/electricity. • Enlist common practices for conserving electricity at workplace.	• Employ appropriate ways to resolve malfunctioning (fumes/ sparks/ emission/ vibration/ noise) and lapse in maintenance of equipment as per requirements. • Perform the steps to prepare a sample material and energy audit reports. • Employ practices for efficient utilization of material and energy/electricity.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• Housekeeping material: Cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel, fire extinguisher • Safety gears: Safety shoes, ear plug, goggles, gloves, helmet, first-aid kit	

Module 3: Communicate Effectively and Efficiently

Mapped to NOS ASC/N9812, v1.0

Terminal Outcomes:

- Use effective communication and interpersonal skills.
- Apply sensitivity while interacting with different genders and people with disabilities.

Duration: *20:00*	**Duration: *35:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of complying with organizational requirements to share information with team members. • Discuss the ways to adjust the communication styles to reflect sensitivity towards gender and persons with disability (PwD). • Explain the importance of respecting personal space of colleagues and customers. • Describe the ways to manage and coordinate with team members for work integration. • State the importance of team goals over individual goals, keeping commitment made to team members, and informing them in case of delays. • Discuss the importance of following the organisation's policies and procedures • Discuss the importance of rectifying errors as per feedback and minimizing mistakes. • Discuss gender-based concepts, issues and legislation as well organization standards, guidelines, rights and duties of PwD. • Discuss the importance of PwD and gender sensitization to ensure that team shows sensitivity towards them. • State the importance of following organizational standards and guidelines related to PwD. • Recall the rights and duties at workplace with respect to PwD. • Outline organisation policies and procedures pertaining to written and verbal communication.	• Employ different means and methods of communication depending upon the requirement to interact with the team members. • Employ appropriate ways to maintain good relationships with team members and superiors. • Apply appropriate techniques to resolve conflicts and manage team members for smooth workflow. • Conduct training sessions to train the team members on proper reporting of completed work and receiving feedback. • Employ suitable ways to escalate problems to superiors as and when required. • Prepare a sample report on the progress and team performance . • Role play a situation on how to offer help to people with disability (PwD) if required at work.
Classroom Aids:	

White board/black board marker/chalk, duster, computer or Laptop attached to LCD projector
Tools, Equipment and Other Requirements

Module 4: Explaining the product requirements, support the manager in finalizing the design specifications and reliability parameters of the product

Mapped to ASC/ N8102, v2.0

Terminal Outcomes:

- Create basic product design by showing product requirements fixed by the CFT Team
- Support in in finalization of design specification by ensuring its reliability and validity of the product design

Duration: *30:00*	**Duration**: *60:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• examine product requirements and type of material fixed by the CFT Team • examine technique and technology to be used in the design of the product • generate a picture/image of the design • verify while designing the physical product every aspect of aesthetic appeal, ergonomics etc. • explain shape/ size/ environmental impact of the design • choose the procedure that displays design hierarchy • assist in design creation for each of the aggregates, body of the vehicle etc. • help the manager in achieving required product specification and verify conformance between design output and design input • assist the manager in deciding the means for providing design input and deciding the means of demonstration that each requirement has been met • support in mechanism creation for capturing design output • help the manager in defining elements related to colour design (interior and exterior) • Identify company manufacturing processes & the equipment in use • explain reliability requirements on the basis of benchmarks, competitive analysis, cost, safety,etc. • Identify type of automotive systems and sequence of operations for each process	• generate a freehand sketch on the basis of image of the product design • generate design geometry by using mechanical CAD (Computer Aided Design) system • create a grid map of the vehicle on a 1:1 scale including all its technical and structural constituents. • Perform a Quality Cost Delivery analysis for all decision metrics relating to developing the body of the car and the cost involved • Prepare key reliability risk items and the corresponding risk reduction strategy . • calculate design reliability and analyse reliability using simulation models. • examine failure risks and mechanics by using the design of experiments methodology to identify factors significant to the life of the vehicle • calculate reliability-related metrics by using Life Data Analysis (LDA) techniques. • Examine methodology to discover defects by performing Reliability Growth (RG) testing • Identify electrical-wiring drawings of existing layout/equipment/systems • Identify QMS requirements • Perform trouble shooting/fault finding in pneumatic, hydraulic, electrical control system elements • Analyse problem solving techniques- TOPS 8D, 7 QC tools etc • Identify robotic instruments used during the process.

• Identify latest technologies and regulations in auto industry	
Classroom Aids:	
Laptop White board, Marker, Projector & stationary	
Tools, Equipment and Other Requirements	
PCs/Laptops, Internet with Wi-Fi (Min2 Mbps Dedicated) 18 documents of PPAP, Design records, Design Records, Authorized Engineering Change Documents, Customer Engineering Approval, Design Failure Modes and Effects Analysis (DFMEA), applied in special situations, Process Flow Diagram, Process Failure Modes and Effects Analysis (PFMEA) Control Plan, Part Submission Warrant (PSW), Engineering Change Documents Dimensional Results, PLC Simulator, Hydraulic, Pneumatic, Electronic Control Systems Simulator, Internet of Things study material and IOT communication devices, Manufacturing Execution system, manufacturing operation management system. Hydraulics and pneumatics systems simulator, PLC Simulator with required software, Air Cylinders, valves, connector/tubing simulators, Pick and place robots assembly Electronics sensor like proximity, optical, magnetic sensors.	

Module 5: ASC/N8103: Design vehicles & components using computer aided technology

Mapped to ASC/ N8103, v2.0

Terminal Outcomes:

- Design the vehicle using CAD/CAE and Conduct design FMEA.
- Perform simulations on the product design and complete the process related to telematics and human machine interface.

Duration: *30:00*	**Duration**: *90:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• recognize design purpose and identify all the ways the failure could happen. • analyse failure mode consequences and determine the seriousness of each effect • examine occurrence rating between 0 and 10 for every case. • Examine current process controls and identify controls thatcan be established for each cause • Analyse detection rating and identify recommended actions (design changes) to lower severity • Demonstrate for architectural design verification. • prepare simulation model to be used . • examine and validate simulation to increase the chances of simulation validation in real world. • Examine and validate that telematics follows requirements and can analyse driver sense. • choose a high-performance HMI (Human Machine Interface) philosophy and style guide with proper principles • examine specific performance and goal objectives for process control. • examine controls to be monitored and manipulated to achieve performance • prepare high-performance graphics design ,following the HMI philosophy and addressing the identified tasks • Identify company manufacturing processes & the equipment in use • Identify type of automotive systems and sequence of operations for each process • Identify problem solving techniques like TOPS 8D, 7 QC tools etc	• examine the application of CAD and CAE and assist the manager in transforming the functional architecture to physical architecture. • Generate product designs according to defined geometrical parameters. • prepare 2D/3D model using CAD/CAE along with engineering inputs. • Examine model using loads to validate the design • prepare design of the smaller parts to check structural viability • perform testing by applying engineering parameters related to speed, cutting pattern etc. to CAD/CAE • generate a rating system (0 to 10) for identifying seriousness of each effect and determine the potential root causes • analyse model and compare behaviour with that of the actual problem environment • prepare and perform the simulation, analyse results and make changes and perform simulation again • give training on the new HMI and control, maintain, and periodically reassess the HMI performance • Identify electrical-wiring drawings of existing layout/equipment/systems • Identify QMS requirements • Perform trouble shooting/fault finding in pneumatic, hydraulic, electrical control system elements

Classroom Aids:
Laptop White board, Marker, Projector & stationary
Tools, Equipment and Other Requirements
PCs/Laptops, Internet with Wi-Fi (Min2 Mbps Dedicated) 18 documents of PPAP, Design records, Design Records, Authorized Engineering Change Documents, Customer Engineering Approval, Design Failure Modes and Effects Analysis (DFMEA), applied in special situations, Process Flow Diagram, Process Failure Modes and Effects Analysis (PFMEA) Control Plan, Part Submission Warrant (PSW), Engineering Change Documents Dimensional Results, PLC Simulator, Hydraulic, Pneumatic, Electronic Control Systems Simulator, Internet of Things study material and IOT communication devices, Manufacturing Execution system, manufacturing operation management system. Hydraulics and pneumatics systems simulator, PLC Simulator with required software, Air Cylinders, valves, connector/tubing simulators, Pick and place robots assembly Electronics sensor like proximity, optical, magnetic sensors.

Module 6: Manage the product data and system integration mechanism

Mapped to ASC/ N8104, v2.0

Terminal Outcomes:

- Create standardization for capturing work analysis.
- Manage product design data by ensuring system integration mechanism are in place.

Duration: *30:00*	**Duration**: *60:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Assist in creating standardized Work Analysis Sheet for analysing basic process used • Verify validation of the work analysis sheet • Explain the time to check that the processes are being conducted within the specified amountof time • Recognize the work sequence order • explain the applicability of different processes to be used • recognize the product and information regarding the product design • recognize product structure management- product material, process management of theproduct • recognize and store information regarding product development and tools to be used • assist in system integration team creation who help to integrate all the parts of the product design data • verify planning and control of the entire system though status control reports, meetings review etc. • examine continued system integration and validation of the data captured • Identify company manufacturing processes & the equipment in use • Identify type of automotive systems and sequence of operations for each process • Identify eligible vendor database for the process and automation systems • Identify operation of electrical equipment's viz motors etc. being used for the process	• generate a Standardized work combination sheet • perform changes in control and assessment management in case of changes to the product design data • create status regarding the product like its history, present use, serialization, part status,customer data • determine existing layout of the processes • Identify electrical-wiring drawings of existing layout/equipment/systems • Identify Quality Management System (QMS) requirements • Prepare PLC, SCADA & electrical elements operation and testing • Perform trouble shooting/fault finding.
Classroom Aids:	
Laptop White board, Marker, Projector & stationary	
Tools, Equipment and Other Requirements	
PCs/Laptops, Internet with Wi-Fi (Min2 Mbps Dedicated)	

18 documents of PPAP, Design records, Design Records, Authorized Engineering Change Documents, Customer Engineering Approval, Design Failure Modes and Effects Analysis (DFMEA), applied in special situations, Process Flow Diagram, Process Failure Modes and Effects Analysis (PFMEA) Control Plan, Part Submission Warrant (PSW), Engineering Change Documents
Dimensional Results, PLC Simulator, Hydraulic, Pneumatic, Electronic Control Systems Simulator, Internet of Things study material and IOT communication devices, Manufacturing Execution system, manufacturing operation management system.
Hydraulics and pneumatics systems simulator, PLC Simulator with required software, Air Cylinders, valves, connector/tubing simulators, Pick and place robots assembly
Electronics sensor like proximity, optical, magnetic sensors.

Module 7: Perform the component designing operation for 3D manufacturing machine

Mapped to ASC/ N8108, v2.0

Terminal Outcomes:

- Generate 3D printable file and optimum modelling curve from design & modelling software packages.

Duration: *20:00*	**Duration**: *40:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• choose encoding format for the 3D printing program file • choose optimum orientation for the part • recognize effect part orientation effect on printing time & the amount of material used • select the slicing layer thickness & its dependencies on surface finish & machining time • rectification of error of the part generation process • recognize functionality of different buttons and switches available on the machine dashboard • identify types of 3D Printing techniques	• change a standard design model into standard tessellation language (.stl) file format. • revise any errors which are generated in the file creation process • relate practical knowledge of the method of curve replication by machine drivers during CAD modelling • Identify company manufacturing processes & the equipment in use • Identify type of automotive systems and sequence of operations for each process • Identify all the symbols and notifications being displayed by the 3D Printing machine and their corresponding meaning • perform uploading and removal of code files from the machine memory
Classroom Aids:	
Laptop White board, Marker, Projector & stationary	
Tools, Equipment and Other Requirements	
PCs/Laptops, Internet with Wi-Fi (Min2 Mbps Dedicated) 18 documents of PPAP, Design records, Design Records, Authorized Engineering Change Documents, Customer Engineering Approval, Design Failure Modes and Effects Analysis (DFMEA), applied in special situations, Process Flow Diagram, Process Failure Modes and Effects Analysis (PFMEA) Control Plan, Part Submission Warrant (PSW), Engineering Change Documents Dimensional Results, PLC Simulator, Hydraulic, Pneumatic, Electronic Control Systems Simulator, Internet of Things study material and IOT communication devices, Manufacturing Execution system, manufacturing operation management system. Hydraulics and pneumatics systems simulator, PLC Simulator with required software, Air Cylinders, valves, connector/tubing simulators, Pick and place robots assembly Electronics sensor like proximity, optical, magnetic sensors.	

Module 8: Select and Operate 3D Printing machine for production

Mapped to ASC/N6811, v1.0

Terminal Outcomes:

- Identify raw material, machine, components and automotive parts involved in manufacturing process.
- Perform the steps to operate and set up the machine for printing the automotive components.
- Demonstrate post-processing activities like quality check, segregation, storage etc.

Duration: *30:00*	**Duration**: *60:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss manufacturing and automotive product design standards and procedures followed in the company. • Explain various 3D Printing technologies such as Fused Deposition Modelling, StereoLithography etc. • List machine operating parameters such as room temperature range, air cleanliness. • List types of files such as .stl, code file, etc generated in the various steps of the process. • Explain standard tesselation language (.stl) code file and its selection criteria for machine operation. • List the steps to be performed for deleting unwanted code files, uploading new code files and selecting any pre-stored program in the machine memory. • Summarise the steps to be performed for checking the critical components of machine. • List steps for preparing 3D printing machine for operation. • List the steps to be performed for operating the 3D printing machine. • Describe post-processing techniques such as removing and cleaning fabricated parts, inspection, segregation etc. of parts. • Discuss ways for removing the fabricated part from machine and support structures from the part. • Explain methods of inspecting the quality and non-conformities of the part.	• Demonstrate how to select the raw material and 3D printing machine for printing the automotive components as per product specifications. • Use appropriate resources to obtain information about part orientation, support structure requirement, machine specifications, machine operating parameters etc. as per the work requirement. • Apply appropriate techniques to decipher the codes to calculate the volume of material • Show how to load appropriate amount of consumables material. • Show how to pre-heat the bed of the machine and set the laser or nozzles temperature of the machine to defined values. • Demonstrate organizational specified procedure of operating the 3D printing machine for printing of automotive components. • Apply appropriate ways to identify and rectify errors in machine during the machine operation. • Show how to stop the machine during an unwanted situation. • Demonstrate how to remove the fabricated part and support structures from the machine carefully. • Apply appropriate ways to clean the part for getting required surface finish. •
Classroom Aids:	
Laptop White board, Marker, Projector & stationary	
Tools, Equipment and Other Requirements	

3D Printing machines- Fixed Deposition Modelling Machine, Stereo-Lithography Machine, Metal Sintering Machine & any other type of 3D printing machine with the all the consumables required. Flash Drive (With pre-stored program)

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
B.E / B.TECH	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	4	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	1	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	**NA**
B.E / B.TECH	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	5	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	0	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	**NA**
M.E / M.TECH	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	3	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	1	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	**NA**

Trainer Certification	
Domain Certification	**Platform Certification**
"Automotive Product Design Lead Engineer, ASC/Q8102, version 2.0". Minimum accepted score is 80%.	"Trainer; MEP/Q2601 v1.0" Minimum accepted score is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
B.E / B.TECH	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	5	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	1	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	**NA**
B.E / B.TECH	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	6	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	0	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	**NA**
M.E / M.TECH	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	4	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	1	Mechanical/ Electrical/ Electronics/ Automobile/ Instrumentation	**NA**

Assessor Certification	
Domain Certification	**Platform Certification**
"Automotive Product Design Lead Engineer, ASC/Q8102, version 2.0". Minimum accepted score is 80%.	"Assessor; MEP/Q2701 v1.0" Minimum accepted score is 80%.

Assessment Strategy

1. Assessment System Overview:

    - Batches assigned to the assessment agencies for conducting the assessment on SDSM/SIP or email
    - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
    - Assessment agency deploys the ToA certified Assessor for executing the assessment
    - SSC monitors the assessment process & records

2. Testing Environment:

    - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
    - Check the duration of the training.
    - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
    - If the batch size is more than 30, then there should be 2 Assessors.
    - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
    - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
    - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
    - Check the availability of the Lab Equipment for the particular Job Role.

3. Assessment Quality Assurance levels / Framework:

    - Question papers created by the Subject Matter Experts (SME)
    - Question papers created by the SME verified by the other subject Matter Experts
    - Questions are mapped with NOS and PC
    - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
    - Assessor must be ToA certified & trainer must be ToT Certified
    - Assessment agency must follow the assessment guidelines to conduct the assessment

4. Types of evidence or evidence-gathering protocol:
    - Time-stamped & geotagged reporting of the assessor from assessment location
    - Center photographs with signboards and scheme specific branding
    - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
    - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:
    - Surprise visit to the assessment location
    - Random audit of the batch
    - Random audit of any candidate

6. Method for assessment documentation, archiving, and access
    - Hard copies of the documents are stored
    - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
    - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
AMC	Annual Maintenance Contract
PPE	Personal Protective Equipment
ERP	Enterprise Resource Planning
PM	Predictive Maintenance
QMS	Quality Management System
PLC	Programmable Logic Controller
SCADA	Supervisory Control And Data Acquisition
TOPS	Team Oriented Problem Solving
AMC	Annual Maintenance Contract
PPE	Personal Protective Equipment
ERP	Enterprise Resource Planning
PM	Predictive Maintenance
QMS	Quality Management System
PLC	Programmable Logic Controller
SCADA	Supervisory Control And Data Acquisition
TOPS	Team Oriented Problem Solving
HMI	Human Machine Interfaces
PLC	Programmable Logic Controller
SCADA	Supervisory Control And Data Acquisition
VFD	Variable Frequency Drive
HMI	Human Machine Interfaces
RFID	Radio Frequency Identification

QMS	Quality Management System
CFT	Complement Fixation Test