Automotive Robotics and Automation Manager

QP Code: ASC/Q8306

Version: 1.0

NSQF Level: 7

Automotive || 153, GF, Okhla Industrial Area, Phase 3
New Delhi 110020 || email:garima@asdc.org.in

Contents

ASC/Q8306: Automotive Robotics and Automation Manager

Brief Job Description

The individual at this job manage activities related to the robotic automation operations and team at shop floor. The individual also plan and manage activities of installation and execution of robotic system.

Personal Attributes

This job requires the individual to work at a desk base job for long hours. The individual should be result oriented and should also be able to demonstrate skills for information ordering, analytical reasoning, problem solving, time management, oral expression and comprehension.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. ASC/N9810: Manage work and resources (Manufacturing)
2. ASC/N9812: Interact effectively with team, customers and others
3. ASC/N8309: Manage robot operations for automobile manufacturing process
4. ASC/N8310: Plan installation and execution of robotic system
5. ASC/N8311: Manage robotic line operations and team
6. ASC/N8312: Liaison with vendors and other departments

Qualification Pack (QP) Parameters

Sector	Automotive
Sub-Sector	Research & Development
Occupation	Automotive Product Development
Country	India
NSQF Level	7
Credits	22
Aligned to NCO/ISCO/ISIC Code	NCO-2015/1223.0101

Minimum Educational Qualification & Experience	Diploma (3 years (Mechanical/Automobile/ Electrical / Electronics) after class 12th from recognized regulatory body) with 5 Years of experience of relevant experience OR B.E./B.Tech (in the relevant field) with 5 Years of experience of relevant experience OR M.E. (in the relevant field) with 4 Years of experience of relevant experience OR M.Tech (in the relevant field) with 4 Years of experience of relevant experience OR Certificate-NSQF ((Automotive Robotics and Automation Simulation Engineer/Automotive Automation and Robotics Engineer Level 6)) with 3 Years of experience of relevant experience
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	22 Years
Last Reviewed On	NA
Next Review Date	NA
NSQC Approval Date	
Version	1.0

ASC/N9810: Manage work and resources (Manufacturing)

Description

This NOS unit is about implementing safety, planning work, adopting sustainable practices for optimising the use of resources.

Scope

The scope covers the following :

- Maintain safe and secure working environment
- Maintain Health and Hygiene
- Effective waste management practices
- Material/energy conservation practices

Elements and Performance Criteria

Maintain safe and secure working environment

To be competent, the user/individual on the job must be able to:

PC1. identify hazardous activities and the possible causes of risks or accidents in the workplace

PC2. implement safe working practices for dealing with hazards to ensure safety of self and others

PC3. conduct regular checks of the machines with support of the maintenance team to identify potential hazards

PC4. ensure that all the tools/equipment/fasteners/spare parts are arranged as per specifications/utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/work instructions

PC5. organise safety drills or training sessions to create awareness amongst others on the identified risks and safety practices

PC6. fill daily check sheet to report improvements done and risks identified

PC7. ensure that relevant safety boards/signs are placed on the shop floor for the safety of self and others

PC8. report any identified breaches in health, safety and security policies and procedures to the designated person

Maintain Health and Hygiene

To be competent, the user/individual on the job must be able to:

PC9. ensure workplace, equipment, restrooms etc. are sanitized regularly

PC10. ensure team is aware about hygiene and sanitation regulations and following them on the shop floor

PC11. ensure availability of running water, hand wash and alcohol-based sanitizers at the workplace

PC12. report advanced hygiene and sanitation issues to appropriate authority

PC13. follow stress and anxiety management techniques and support employees to cope with stress, anxiety etc

PC14. wear and dispose PPEs regularly and appropriately

Effective waste management practices

To be competent, the user/individual on the job must be able to:

PC15. ensure recyclable, non-recyclable and hazardous wastes are segregated as per SOP

PC16. ensure proper mechanism is followed while collecting and disposing of non-recyclable, recyclable and reusable waste

Material/energy conservation practices

To be competent, the user/individual on the job must be able to:

PC17. ensure malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment are resolved effectively

PC18. prepare and analyze material and energy audit reports to decipher excessive consumption of material and water

PC19. identify possibilities of using renewable energy and environment friendly fuels

PC20. identify processes where material and energy/electricity utilization can be optimized

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organisation procedures for health, safety and security, individual role and responsibilities in this context

KU2. the organisation's emergency procedures for different emergency situations and the importance of following the same

KU3. evacuation procedures for workers and visitors

KU4. how and when to report hazards as well as the limits of responsibility for dealing with hazards

KU5. potential hazards, risks and threats based on the nature of work

KU6. various types of fire extinguisher

KU7. various types of safety signs and their meaning

KU8. appropriate first aid treatment relevant to different condition e.g. bleeding, minor burns, eye injuries etc.

KU9. relevant standards, procedures and policies related to 5S followed in the company

KU10. the various materials used and their storage norms

KU11. importance of efficient utilisation of material and water

KU12. basics of electricity and prevalent energy efficient devices

KU13. common practices of conserving electricity

KU14. common sources and ways to minimize pollution

KU15. categorisation of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics

KU16. waste management techniques

KU17. significance of greening

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read safety instructions/guidelines
GS2. modify work practices to improve them
GS3. work with supervisors/team members to carry out work related tasks
GS4. complete tasks efficiently and accurately within stipulated time
GS5. inform/report to concerned person in case of any problem
GS6. make timely decisions for efficient utilization of resources
GS7. write reports such as accident report, in at least English/regional language

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Maintain safe and secure working environment	**20**	**13**	**-**	**8**
PC1. identify hazardous activities and the possible causes of risks or accidents in the workplace	4	2	-	2
PC2. implement safe working practices for dealing with hazards to ensure safety of self and others	3	1	-	2
PC3. conduct regular checks of the machines with support of the maintenance team to identify potential hazards	2	2	-	1
PC4. ensure that all the tools/equipment/fasteners/spare parts are arranged as per specifications/utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/work instructions	3	2	-	1
PC5. organise safety drills or training sessions to create awareness amongst others on the identified risks and safety practices	2	-	-	-
PC6. fill daily check sheet to report improvements done and risks identified	2	2	-	-
PC7. ensure that relevant safety boards/signs are placed on the shop floor for the safety of self and others	2	2	-	1
PC8. report any identified breaches in health, safety and security policies and procedures to the designated person	2	2	-	1
Maintain Health and Hygiene	**13**	**7**	**-**	**5**
PC9. ensure workplace, equipment, restrooms etc. are sanitized regularly	3	2	-	1
PC10. ensure team is aware about hygiene and sanitation regulations and following them on the shop floor	2	1	-	-
PC11. ensure availability of running water, hand wash and alcohol-based sanitizers at the workplace	2	2	-	1
PC12. report advanced hygiene and sanitation issues to appropriate authority	1	1	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. follow stress and anxiety management techniques and support employees to cope with stress, anxiety etc	2	1	-	1
PC14. wear and dispose PPEs regularly and appropriately	3	-	-	1
Effective waste management practices	**6**	**4**	**-**	**1**
PC15. ensure recyclable, non-recyclable and hazardous wastes are segregated as per SOP	3	2	-	-
PC16. ensure proper mechanism is followed while collecting and disposing of non-recyclable, recyclable and reusable waste	3	2	-	1
Material/energy conservation practices	**11**	**6**	**-**	**6**
PC17. ensure malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment are resolved effectively	2	2	-	1
PC18. prepare and analyze material and energy audit reports to decipher excessive consumption of material and water	3	2	-	1
PC19. identify possibilities of using renewable energy and environment friendly fuels	3	1	-	2
PC20. identify processes where material and energy/electricity utilization can be optimized	3	1	-	2
NOS Total	**50**	**30**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9810
NOS Name	Manage work and resources (Manufacturing)
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	30/09/2021
Next Review Date	30/09/2024
NSQC Clearance Date	30/09/2021

ASC/N9812: Interact effectively with team, customers and others

Description

This unit is about communicating with team members, superior and others.

Scope

The scope covers the following :

- Communicate effectively with team members
- Interact with superiors
- Respect gender and ability differences

Elements and Performance Criteria

Communicate effectively with team members

To be competent, the user/individual on the job must be able to:

PC1. implement ways to share information with team members in line with organisational requirements

PC2. ensure that work requirements are clearly communicated to the team members through all means including face-to-face, telephonic and written

PC3. manage and co-ordinate with team members to integrate work as per requirements

PC4. work in a way that show respect for all team members and customers

PC5. carry out commitments made to team members and let them know in good time if there is any discrepancy with reasons

PC6. resolve conflicts within the team members at work to achieve smooth workflow

PC7. guide the team members to follow the organisation’s policies and procedures

PC8. ensure team goals are given preference over individual goals

PC9. respect personal space of colleagues and customers

Interact with superiors

To be competent, the user/individual on the job must be able to:

PC10. report progress on job allocated and team performance to the superiors

PC11. escalate problems to superiors that cannot be handled

PC12. train the team members to report completed work and receive feedback on work done

PC13. encourage team members to rectify errors as per feedback and minimize mistakes in future

Respect gender and ability differences

To be competent, the user/individual on the job must be able to:

PC14. ensure team shows sensitivity towards all genders and PwD

PC15. adjust communication styles to reflect gender sensitivity and sensitivity towards person with disability

PC16. help PwD team members to overcome the challenges, if asked

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the importance of effective communication and establishing good working relationships with team members and superiors
KU2. different methods of communication as per the circumstances
KU3. gender based concepts, issues and legislation
KU4. organisation standards and guidelines to be followed for PwD
KU5. rights and duties at workplace with respect to PwD
KU6. organisation policies and procedures pertaining to written and verbal communication

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read safety instructions/guidelines
GS2. modify work practices to improve them
GS3. work with supervisors/team members to carry out work related tasks
GS4. complete tasks efficiently and accurately within stipulated time
GS5. make timely decisions for efficient utilization of resources
GS6. read instructions/guidelines/procedures
GS7. write in English/any one language

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Communicate effectively with team members	**20**	**14**	**-**	**8**
PC1. implement ways to share information with team members in line with organisational requirements	2	2	-	-
PC2. ensure that work requirements are clearly communicated to the team members through all means including face-to-face, telephonic and written	2	2	-	2
PC3. manage and co-ordinate with team members to integrate work as per requirements	2	1	-	2
PC4. work in a way that show respect for all team members and customers	3	1	-	2
PC5. carry out commitments made to team members and let them know in good time if there is any discrepancy with reasons	2	2	-	-
PC6. resolve conflicts within the team members at work to achieve smooth workflow	3	2	-	-
PC7. guide the team members to follow the organisation’s policies and procedures	2	1	-	-
PC8. ensure team goals are given preference over individual goals	2	1	-	-
PC9. respect personal space of colleagues and customers	2	2	-	2
Interact with superiors	**18**	**10**	**-**	**7**
PC10. report progress on job allocated and team performance to the superiors	4	3	-	2
PC11. escalate problems to superiors that cannot be handled	4	2	-	1
PC12. train the team members to report completed work and receive feedback on work done	5	2	-	2
PC13. encourage team members to rectify errors as per feedback and minimize mistakes in future	5	3	-	2

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Respect gender and ability differences	**12**	**6**	**-**	**5**
PC14. ensure team shows sensitivity towards all genders and PwD	4	2	-	2
PC15. adjust communication styles to reflect gender sensitivity and sensitivity towards person with disability	4	2	-	2
PC16. help PwD team members to overcome the challenges, if asked	4	2	-	1
NOS Total	**50**	**30**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9812
NOS Name	Interact effectively with team, customers and others
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	30/12/2021
Next Review Date	28/07/2025
NSQC Clearance Date	28/07/2022

ASC/N8309: Manage robot operations for automobile manufacturing process

Description

This NOS unit is about managing the robotic operations, finalization for automobile manufacturing process and organizing the numbers of equipment and resources needed to commission the process.

Scope

The scope covers the following :

- Feasibility study analysis and monitoring
- Application improvement process establishment
- Setup and equipment management
- Work load distribution

Elements and Performance Criteria

Feasibility study analysis and monitoring

To be competent, the user/individual on the job must be able to:

PC1. verify and approve documents like need analysis, feasibility, technical specification, process flow diagram, product drawings and other engineering documents

PC2. interpret the scope of process improvements in the work cell

PC3. monitor the problems and their solutions during I/O mapping in a robotic cell

PC4. approve assembly plan and sequence prepare by team

PC5. monitor material loading and unloading sequence in the robotic cell

Application improvement process establishment

To be competent, the user/individual on the job must be able to:

PC6. collect and interpret the data of production volume and available time for the production

PC7. interpret total work to be done on robotic systems and application to be implemented on robotic system

PC8. ensure that other jigs/fixture and equipment required to run a robotic automation cell are organized and maintained properly

PC9. define and standardize work cycle of the complete process

Setup and equipment management

To be competent, the user/individual on the job must be able to:

PC10. identify and arrange the machine type and equipment to be used in the application

PC11. identify and arrange the machine type and equipment to be used in the application

PC12. verify and approve process flow diagram prepared by team

Workload distribution

To be competent, the user/individual on the job must be able to:

PC13. identify potential failures in process by analysing the FMEA process report

PC14. interpret workload of the process for robot system and manpower assigned

PC15. interpret production volume and distribution of work among engineers, technicians and operators

PC16. analyse the process repeatability and cycle time to reconsider the entire process

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organisation procedures for health, safety and security, individual role and responsibilities in this context

KU2. relevant standards, procedures and policies related to robotic operations followed in the company

KU3. use of robots in different manufacturing and assembly operations

KU4. basics of electrical safety

KU5. safe operation of electronic equipment like computers, robotic systems etc.

KU6. cyber safety and work confidentiality good practices

KU7. importance of different documents involved in product development

KU8. BIW Structure and different joining technologies

KU9. classification of the automation elements as power and safety elements (electrical incomer, circuit breakers, compressed air, hydraulic power pack, FRL, pressure relief valve etc.), input elements (proximity sensors, push buttons, limit switches, reed switches), control elements (relay, contactors, VFD, HMI, pneumatic and hydraulic solenoid valves) and output elements (indicators, buzzer, induction motors, pneumatic and hydraulic actuators)

KU10. types of control system used in the automation system

KU11. installation process includes mounting, wiring standards, routing, element assembly

KU12. programming of PLC and simulation tools from different makers along with integration of automation elements

KU13. calculation of cycle time of process

KU14. procedure of developing a manufacturing process

KU15. possible failures of automation system

KU16. procedure of FMEA process

KU17. different check sheets and technical documents

KU18. how to read visual controls, graphs etc.

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. follow instructions, guidelines, procedures, rules, and service level agreements

GS2. listen effectively and communicate information accurately

GS3. follow rule-based decision-making processes

GS4. make decisions on suitable courses

GS5. plan and organize the work to achieve targets and meet deadlines

GS6. apply problem-solving approaches to different situations

GS7. analyse the business impact and disseminate relevant information to others
GS8. apply balanced judgments to different situations
GS9. check the work is complete and free from errors

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Feasibility study analysis and monitoring	**14**	**14**	**-**	**7**
PC1. verify and approve documents like need analysis, feasibility, technical specification, process flow diagram, product drawings and other engineering documents	2	3	-	1
PC2. interpret the scope of process improvements in the work cell	2	3	-	1
PC3. monitor the problems and their solutions during I/O mapping in a robotic cell	4	3	-	2
PC4. approve assembly plan and sequence prepare by team	4	3	-	2
PC5. monitor material loading and unloading sequence in the robotic cell	2	2	-	1
Application improvement process establishment	**12**	**12**	**-**	**6**
PC6. collect and interpret the data of production volume and available time for the production	3	3	-	1
PC7. interpret total work to be done on robotic systems and application to be implemented on robotic system	3	3	-	2
PC8. ensure that other jigs/fixture and equipment required to run a robotic automation cell are organized and maintained properly	3	3	-	1
PC9. define and standardize work cycle of the complete process	3	3	-	2
Setup and equipment management	**6**	**6**	**-**	**4**
PC10. identify and arrange the machine type and equipment to be used in the application	2	2	-	1
PC11. identify and arrange the machine type and equipment to be used in the application	2	2	-	2
PC12. verify and approve process flow diagram prepared by team	2	2	-	1
Workload distribution	**8**	**8**	**-**	**3**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. identify potential failures in process by analysing the FMEA process report	2	2	-	1
PC14. interpret workload of the process for robot system and manpower assigned	2	2	-	1
PC15. interpret production volume and distribution of work among engineers, technicians and operators	2	2	-	-
PC16. analyse the process repeatability and cycle time to reconsider the entire process	2	2	-	1
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N8309
NOS Name	Manage robot operations for automobile manufacturing process
Sector	Automotive
Sub-Sector	Research & Development
Occupation	Automotive Product Development
NSQF Level	7
Credits	TBD
Version	1.0
Next Review Date	NA

ASC/N8310: Plan installation and execution of robotic system

Description

This NOS unit is about planning and execution of different robotic system processes like installation, commissioning and testing.

Scope

The scope covers the following :

- Verification of robot and EOAT (End of arm tooling) selection
- Interpret layout marking of robotic cell and tool assembly
- Analyse equipment/components and its operation in the cell

Elements and Performance Criteria

Verification of robot and EOAT (End of arm tooling) selection

To be competent, the user/individual on the job must be able to:

PC1. identify profile of the product panel and application of the robot in it by interpreting the process documents

PC2. read and configure manual and technical specification of robots and define the requirements for the robot needed

PC3. ensure that selection of robot is done on the basis of pay load requirements, reachability requirements and accuracy requirements of the robot in the application

PC4. ensure that EOAT is selected on the basis of its capability of handling maximum load

PC5. interpret and finalize the zoning area and stroke area of robot by interpreting the process documents

Interpret layout marking of robotic cell and tool assembly

To be competent, the user/individual on the job must be able to:

PC6. finalize and configure area required for system implementation and availability of power, pneumatic and coolant supply.

PC7. approve plan for material space, trolleys, supply of material to line side & material handling equipment prepared by team

PC8. ensure that finalized position of equipment in the cell and robot positions is as per the design document

Analyse equipment/components and its operation in the cell

To be competent, the user/individual on the job must be able to:

PC9. ensure that placement of all the components of robotic cell like robot, tip dressers, jigs/fixture/grippers, docking units, sensor and cable trays etc. is as per the design document

PC10. finalize the required work tables of fixtures/jigs, orientation of loading and unloading and material flow in the cell

PC11. maintain the production flow at shop floor

PC12. allocate team members for particular operation in the cell

PC13. monitor and audit robot programs at shop floor for cycle time improvement and productivity enhancement

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organisation procedures for health, safety and security, individual role and responsibilities in this context
KU2. relevant standards, procedures and policies related to robotic operations followed in the company
KU3. data safety and non-disclosers norms
KU4. cyber safety and work confidentiality good practices
KU5. data and folder standards
KU6. different check sheets and technical documents
KU7. visual controls, graphs etc.
KU8. robot anatomy and robot applications
KU9. EOAT anatomy and pneumatic systems
KU10. robot programming and applications

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. follow instructions, guidelines, procedures, rules, and service level agreements
GS2. listen effectively and communicate information accurately
GS3. follow rule-based decision-making processes
GS4. make decisions on suitable courses
GS5. plan and organize the work to achieve targets and meet deadlines
GS6. apply problem-solving approaches to different situations
GS7. analyse the business impact and disseminate relevant information to others
GS8. apply balanced judgments to different situations
GS9. check the work is complete and free from errors

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Verification of robot and EOAT (End of arm tooling) selection	**14**	**14**	**-**	**6**
PC1. identify profile of the product panel and application of the robot in it by interpreting the process documents	3	2	-	1
PC2. read and configure manual and technical specification of robots and define the requirements for the robot needed	3	2	-	2
PC3. ensure that selection of robot is done on the basis of pay load requirements, reachability requirements and accuracy requirements of the robot in the application	3	4	-	1
PC4. ensure that EOAT is selected on the basis of its capability of handling maximum load	3	3	-	1
PC5. interpret and finalize the zoning area and stroke area of robot by interpreting the process documents	2	3	-	1
Interpret layout marking of robotic cell and tool assembly	**10**	**12**	**-**	**6**
PC6. finalize and configure area required for system implementation and availability of power, pneumatic and coolant supply.	3	4	-	2
PC7. approve plan for material space, trolleys, supply of material to line side & material handling equipment prepared by team	4	4	-	2
PC8. ensure that finalized position of equipment in the cell and robot positions is as per the design document	3	4	-	2
Analyse equipment/components and its operation in the cell	**16**	**14**	**-**	**8**
PC9. ensure that placement of all the components of robotic cell like robot, tip dressers, jigs/fixture/grippers, docking units, sensor and cable trays etc. is as per the design document	4	3	-	2

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. finalize the required work tables of fixtures/jigs, orientation of loading and unloading and material flow in the cell	4	3	-	2
PC11. maintain the production flow at shop floor	3	2	-	1
PC12. allocate team members for particular operation in the cell	2	2	-	1
PC13. monitor and audit robot programs at shop floor for cycle time improvement and productivity enhancement	3	4	-	2
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N8310
NOS Name	Plan installation and execution of robotic system
Sector	Automotive
Sub-Sector	Research & Development
Occupation	Automotive Product Development
NSQF Level	7
Credits	TBD
Version	1.0
Next Review Date	NA

ASC/N8311: Manage robotic line operations and team

Description

This NOS is about managing manpower and availability of material on robotic line. It is also about managing production operations and implementing process and team improvement practices for achieving the targets.

Scope

The scope covers the following :

- Manage manpower and material for the shift/line
- Manage Robotic Operations
- Implement process improvement techniques
- Implement team improvement practices

Elements and Performance Criteria

Manage manpower and material for the shift/line

To be competent, the user/individual on the job must be able to:

PC1. allocate requisite manpower based on skill matrix to achieve production targets

PC2. support Shift In Charge/Process head/Shop head in finalizing the shift rosters for the week and month based on the production plan

PC3. maintain the information on leaves/in-out time and shift/line overtime of the team and share the information with the concerned authorities as per the organisational procedures

PC4. send inventory requirements to stores and purchase department and follow up with them to ensure the timely receipt of materials (Spares, Consumables, etc.)

PC5. maintain the movement of material and work pieces on the shop floor according to the TAKT time prescribed in the SOP/Work Plans

PC6. ensure that the operators and helpers have the required tools and equipment at the start of production process

PC7. ensure optimal resource utilization

Manage Robotic Operations

To be competent, the user/individual on the job must be able to:

PC8. co-ordinate with other departments like stores, paint shop, assembly line, quality, safety, production planning etc. regarding resolution of inter-related problems and achieving required production target and quality standards

PC9. • implement corrective actions to reduce losses and wastages during shift operation and
• minimum rejection of components

PC10. prepare daily and monthly production MIS reports to analyse the actual performance with the production target and report the same to production incharge

PC11. verify the production and material movement related data entries in the system (manual/ERP) for the line/shift and ensure correctness of the data

PC12. support the maintenance team in finalizing and executing the preventive maintenance schedule for the shop/line

PC13. support the incharge/Engineer/Shop Head in analysing the various data sheets and reports related to production, maintenance, manpower deployment etc.

Implement process improvement techniques

To be competent, the user/individual on the job must be able to:

PC14. analyse possible areas of improvements in production line and identify corrective measures to address the gaps

PC15. carry out audit of production process for capability of each operation and prepare reports on the non-compliances for the regulatory authorities by following organizational procedures

PC16. implement various process improvement techniques like Kaizen, 5S, Poka Yoke, TQM etc. on the production line to rectify the failure and gaps in the production process

PC17. analyse machine breakdown trends and current maintenance process to identify areas of improvement and corrective actions for improving the same

PC18. monitor and review the effectiveness of process improvement techniques and corrective actions on production and prepare reports for the regulatory authorities on the same

Implement team improvement practices

To be competent, the user/individual on the job must be able to:

PC19. encourage team members/operators to suggest quality improvement measures through suggestion schemes, evaluate feasibility of the ideas and discuss their implementation with seniors

PC20. conduct daily floor meeting/morning meetings/staff meetings to communicate the information such as production targets, new guidelines, new processes etc. to team

PC21. organise training sessions for the operators and technicians to improve their skills and knowledge on new techniques and methods

PC22. resolve grievances within the team or escalate them to the concerned authorities if they are beyond the scope

PC23. counsel employees for any work related issues or any personal problems highlighted by the employee

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. relevant manufacturing, quality and maintenance standards and procedures followed in the organisation

KU2. functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution

KU3. requirement of raw materials, tools and equipment on the shift/line

KU4. how to prepare shift roster and maintain performance information of the team

KU5. use of ERP system for maintaining and updating production line data

KU6. documents and reports related to production process

KU7. various process improvement techniques like Kaizen, 5S, Poka Yoke, TQM etc

KU8. how to audit gaps and issues in production process and their analysis

KU9. various employee engagement and development practices

KU10. how to handle and solve employee grievances

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read and interpret work instructions, reports and process documents
GS2. communicate the production requirements and issues to the seniors and other departments
GS3. attentively listen and comprehend the information given by the master technician/team members
GS4. write reports related to production process in English/regional language
GS5. recognise a workplace problem and take suitable action
GS6. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
GS7. plan and organise work according to the work requirements
GS8. report to the supervisor or deal with a colleague individually, depending on the type of concern
GS9. complete the assigned tasks with minimum supervision
GS10. explore new approach of doing things to resolve issues
GS11. suggest improvements (if any) in current ways of working

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Manage manpower and material for the shift/line	**9**	**12**	**-**	**6**
PC1. allocate requisite manpower based on skill matrix to achieve production targets	2	2	-	1
PC2. support Shift In Charge/Process head/Shop head in finalizing the shift rosters for the week and month based on the production plan	2	2	-	1
PC3. maintain the information on leaves/in-out time and shift/line overtime of the team and share the information with the concerned authorities as per the organisational procedures	1	2	-	1
PC4. send inventory requirements to stores and purchase department and follow up with them to ensure the timely receipt of materials (Spares, Consumables, etc.)	1	2	-	1
PC5. maintain the movement of material and work pieces on the shop floor according to the TAKT time prescribed in the SOP/Work Plans	1	2	-	1
PC6. ensure that the operators and helpers have the required tools and equipment at the start of production process	1	1	-	1
PC7. ensure optimal resource utilization	1	1	-	-
Manage Robotic Operations	**9**	**9**	**-**	**6**
PC8. co-ordinate with other departments like stores, paint shop, assembly line, quality, safety, production planning etc. regarding resolution of inter-related problems and achieving required production target and quality standards	2	2	-	1
PC9. • implement corrective actions to reduce losses and wastages during shift operation and • minimum rejection of components	1	1	-	1
PC10. prepare daily and monthly production MIS reports to analyse the actual performance with the production target and report the same to production incharge	1	1	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. verify the production and material movement related data entries in the system (manual/ERP) for the line/shift and ensure correctness of the data	1	2	-	1
PC12. support the maintenance team in finalizing and executing the preventive maintenance schedule for the shop/line	2	1	-	1
PC13. support the incharge/Engineer/Shop Head in analysing the various data sheets and reports related to production, maintenance, manpower deployment etc.	2	2	-	1
Implement process improvement techniques	**12**	**10**	**-**	**4**
PC14. analyse possible areas of improvements in production line and identify corrective measures to address the gaps	2	2	-	1
PC15. carry out audit of production process for capability of each operation and prepare reports on the non-compliances for the regulatory authorities by following organizational procedures	2	2	-	-
PC16. implement various process improvement techniques like Kaizen, 5S, Poka Yoke, TQM etc. on the production line to rectify the failure and gaps in the production process	2	2	-	1
PC17. analyse machine breakdown trends and current maintenance process to identify areas of improvement and corrective actions for improving the same	3	2	-	1
PC18. monitor and review the effectiveness of process improvement techniques and corrective actions on production and prepare reports for the regulatory authorities on the same	3	2	-	1
Implement team improvement practices	**10**	**9**	**-**	**4**
PC19. encourage team members/operators to suggest quality improvement measures through suggestion schemes, evaluate feasibility of the ideas and discuss their implementation with seniors	2	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. conduct daily floor meeting/morning meetings/staff meetings to communicate the information such as production targets, new guidelines, new processes etc. to team	2	2	-	1
PC21. organise training sessions for the operators and technicians to improve their skills and knowledge on new techniques and methods	2	2	-	1
PC22. resolve grievances within the team or escalate them to the concerned authorities if they are beyond the scope	2	2	-	1
PC23. counsel employees for any work related issues or any personal problems highlighted by the employee	2	1	-	-
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N8311
NOS Name	Manage robotic line operations and team
Sector	Automotive
Sub-Sector	Research & Development
Occupation	Automotive Product Development
NSQF Level	7
Credits	TBD
Version	1.0
Next Review Date	NA

ASC/N8312: Liaison with vendors and other departments

Description

This NOS unit is about coordination with vendor organizations/departments and to run and improve the processes successfully.

Scope

The scope covers the following :

- Collaboration with system developers
- Pre and post support
- Process and technology study and scope of development

Elements and Performance Criteria

Collaboration with system developers

To be competent, the user/individual on the job must be able to:

PC1. interact with different vendors for developing the robotic automation system to meet all the information integration and information flow starting from conception of the idea till implementation of the robotic system

PC2. ensure that integrators/developers incorporate all the necessary requirement such what level of information access will be different department and different level of people as per requirement/hierarchy system

PC3. carry out the techno-commercial feasibility analysis with system developer to ensure it fall under budgeted plan

PC4. estimate total cost of ownership (Operating labour, software and hardware) for the implementation of robotic system in the organization on the basis of results of techno-commercial feasibility analysis

Pre and post support activities

To be competent, the user/individual on the job must be able to:

PC5. ensure the concerned department and system engineers are trained about usage and application before the system installation

PC6. arrange training for the users by system developers for easy access of automation system

PC7. ensure users get appropriate level of information access as per their usage requirement based sensitivity of the information

Process and scope of development

To be competent, the user/individual on the job must be able to:

PC8. analyse the ratio of automation implementation and study the process thoroughly

PC9. define the scope of development for the team in current process

PC10. define information flow among the team members related to the new technology of robotic automation

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organizational policies, procedures, and guidelines that relate to designing and maintaining network
KU2. relevant standards, procedures and policies related to robotic operations followed in the company
KU3. organizational procedure of interacting with vendors and others
KU4. Pre and post support activities need to perform
KU5. data safety and non-disclosers norms
KU6. cyber safety and work confidentiality good practices
KU7. data and folder standards
KU8. various check sheets and technical documents related to work
KU9. how to read visual controls, graphs etc.
KU10. robot anatomy and robot applications
KU11. various methods of information flow in the organisation

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. follow instructions, guidelines, procedures, rules, and service level agreements
GS2. listen effectively and communicate information accurately
GS3. follow rule-based decision-making processes
GS4. make decisions on suitable courses
GS5. plan and organize the work to achieve targets and meet deadlines
GS6. apply problem-solving approaches to different situations
GS7. analyse the business impact and disseminate relevant information to others
GS8. apply balanced judgments to different situations
GS9. check the work is complete and free from errors

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Collaboration with system developers	**15**	**15**	**-**	**8**
PC1. interact with different vendors for developing the robotic automation system to meet all the information integration and information flow starting from conception of the idea till implementation of the robotic system	3	3	-	2
PC2. ensure that integrators/developers incorporate all the necessary requirement such what level of information access will be different department and different level of people as per requirement/hierarchy system	4	4	-	2
PC3. carry out the techno-commercial feasibility analysis with system developer to ensure it fall under budgeted plan	4	4	-	2
PC4. estimate total cost of ownership (Operating labour, software and hardware) for the implementation of robotic system in the organization on the basis of results of techno-commercial feasibility analysis	4	4	-	2
Pre and post support activities	**15**	**15**	**-**	**6**
PC5. ensure the concerned department and system engineers are trained about usage and application before the system installation	5	5	-	2
PC6. arrange training for the users by system developers for easy access of automation system	5	5	-	2
PC7. ensure users get appropriate level of information access as per their usage requirement based sensitivity of the information	5	5	-	2
Process and scope of development	**10**	**10**	**-**	**6**
PC8. analyse the ratio of automation implementation and study the process thoroughly	3	3	-	2
PC9. define the scope of development for the team in current process	3	3	-	2

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. define information flow among the team members related to the new technology of robotic automation	4	4	-	2
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N8312
NOS Name	Liaison with vendors and other departments
Sector	Automotive
Sub-Sector	Research & Development
Occupation	Automotive Product Development
NSQF Level	7
Credits	4
Version	1.0
Next Review Date	NA

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

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 centre based on these criteria.

5. In case of successfully passing only certain number of NOSs, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

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

Minimum Aggregate Passing % at QP Level : 70

(**Please note**: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N9810.Manage work and resources (Manufacturing)	50	30	-	20	100	15
ASC/N9812.Interact effectively with team, customers and others	50	30	-	20	100	10
ASC/N8309.Manage robot operations for automobile manufacturing process	40	40	-	20	100	20
ASC/N8310.Plan installation and execution of robotic system	40	40	-	20	100	20
ASC/N8311.Manage robotic line operations and team	40	40	-	20	100	20
ASC/N8312.Liaison with vendors and other departments	40	40	0	20	100	15
Total	**260**	**220**	**0**	**120**	**600**	**100**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.
Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.

Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.