Automotive IIOT Application Specialist

QP Code: ASC/Q6415

NSQF Level: 6

Version: 1.0

Job Role: Automotive IIOT Application Specialist

Brief Job Description:

The individual at this job is responsible for managing and monitoring activities of integration of machines, robots, and Automation Systems in Healthy Communication, establish healthy communication using network protocols, remote monitoring and fetch vital machine data using IIOT edge devices within an organization for all its processes, the new development, production and application phases.

Personal Attributes:
This job requires the individual to work at a desk-based 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:
ASC/N9810: Manage work and resources (Manufacturing)
ASC/N6438– Plan and design a Network Architecture using IIOT Solutions
ASC/N6447– Manage integration of machineries / Automation Systems in Healthy Communication via IIOT Sensor
ASC/N6448 – Use Analytics, Edge & Cloud Computing Technologies to make Predictions on Production & Machineries
ASC/N8332– Liaison with vendors and other departments
DGT/VSQ/N0104-Employability Skills (120 hours)

Qualification Pack (QP) Parameters

Sector	Automotive
Sub sector	Manufacturing
Occupation	Production Engineering
Country	India
NSQF Level	6
Aligned to NCO/ISCO/ISIC Code	NCO-2015/2151.0602
Minimum Educational Qualification & Experience	B.E./B.Tech in the relevant field with 1 Year of relevant experience OR Pursuing 2nd year of M.E./M.Tech in the relevant field and continuous education OR Certificate-NSQF (Automotive IIOT Application Engineer Level 5) with 2 Years 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	23-06-2023
Next Review Date	23-06-2026
Deactivation Date	23-06-2026
NSQC Approval Date	23-06-2023
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	-	-

	Theory Marks	Practical Marks	Project Marks	Viva Marks
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

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. report advanced hygiene and sanitation issues to appropriate authority	1	1	-	1
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	30/12/2021
Next Review Date	28/07/2025
NSQC Clearance Date	28/07/2022
Reference code on NQR	NA
NQR Version	NA

ASC/N6438: Plan and design a Network Architecture using IIOT Solutions

This unit is about designing a network having machines, robot, automation systems, and network dashboards while taking various considerations, regulations, and Pertinent requirements into account.

Scope

The Scope Covers the following: - □
      Prepare for building architecture
- Interpret the various network parameters required as per design
- Develop the network as per design requirements
- Monitor the systems and devices mapping in network

Elements and Performance Criteria (PC)

Prepare for building architecture
To be competent, the user/individual on the job must be able to:

PC1. Obtain the design document and project develop requirements from the organization/OEM

PC2. Identify and select appropriate development tools, coding language, development platform, OS etc. as per the project requirements

PC3. Evaluate the IIOT network requirement like node allotment, station setting

PC4. Identify and select the machines, automation system to be connected in the IIOT network

PC5. Identify the suitable communication model, topology to connect the machines & automation system

Interpret the various network parameters required as per design To be competent, the user/individual on the job must be able to:

PC6. Support in designing of wireless/wired network nodes while taking into consideration the varieties of IIOT sensors, I/O link, edge devices, cloud service, and other networking devices

PC7. Ensure appropriate wired/wireless connectivity protocols are applied for Machine-to-Machine communications

PC8. Ensure appropriate wired/wireless connectivity protocols are applied for edge device-cloud communications

PC9. Verify the network parameters like communication speed, network topology, node address of different devices in the IIOT network

Develop the network as per design requirements
To be competent, the user/individual on the job must be able to:

PC10. Support team in building code and configure software, its components and their oriented design

PC11. Support team in configuring ports and interfaces, Sender-Receiver communication and ClientServer communication as per the requirement

PC12. Guide the team during assigning nodes to every device in the system

PC13. Monitor that the nodes are optimized appropriately as per design document

PC14. Validate codes of all the components of architecture to ensure required output

PC15. Approve network design based on industrial requirement

PC16. Evaluate regulatory aspects of shopfloor network such as permitted frequency bands, possible interference due to high voltage line

PC17. Design and develop networking dashboards used for network monitoring with help from edge computing devices

PC18. Monitor timelines/deadlines and host review meetings

PC19. Ensure that the team is documenting the final network architecture plan appropriately

Monitor the systems and devices mapping in network
To be competent, the user/individual on the job must be able to:

PC20. Support the team during selection of the devices & checking their compatibility with the network and system

PC21. Monitor the IIOT network parameters like node address, communication speed and their effect on the network

PC22. Monitor that the team is mapping the node address of devices connected in the IIOT network appropriately and as per the design document and organizational standards

PC23. Verify that defined security standards and encryptions are followed in the EDGE boards and DATA links and as per the design document

PC24. Support the team in conducting communication test across all devices in the IIOT Network

PC25. Record the healthy status of all devices & report to organizational project review committee

Knowledge and Understandings (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. Use of robots in different manufacturing and assembly operations

KU3. Safe operation of electronic equipment like computers, robotic systems etc

KU4. Relevant standards, procedures and policies related to robotic operations followed in the company

KU5. Data safety and Non-Discloser's Norms.

KU6. Designing and developing networks for the solution

KU7. Cyber safety and Work Confidentiality good practices

KU8. Data and folder standards

KU9. Different check sheets and technical documents

KU10. IIOT sensors, I/O link, edge devices, cloud service, and other networking devices required

KU11. Automation Systems Like PLC, Pneumatics, Hydraulics, HMI, Industrial Sensors

KU12. Wired/wireless connectivity protocols for Machine-to-Machine communications

KU13. Wired/wireless connectivity protocols for edge device-cloud communications

KU14. Network parameters like communication speed, network topology, node address of different devices

KU15. Impacts of network on the environment and human health

Generic Skills (GS)

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

GS1. Write basic level notes and observations

GS2. Modify work practices to improve them

GS3. Note down observations related to the process

GS4. Write information documents to internal departments and internal teams

GS5. Monitoring of tasks completion efficiently and accurately within stipulated time

GS6. Persuade team members to follow all guidelines and improvement procedures

GS7. Make timely decisions for efficient utilization of resources

GS8. Be punctual and utilize time efficiently

GS9. Follow shop floor rules and avoid deviations

GS10. Encourage self and other to take greater responsibilities in the task

GS11. Question the process head in order to understand the activity

GS12. Do what is right, not what is a popular practice

GS13. Lead by example in plant premises and work area

GS14. Ensure self-discipline and cleanliness on daily basis

GS15. Use common sense and knowledge in day-to-day decision making

GS16. Accept additional responsibilities to provide more flexibility to the team

GS17. Use reasoning skills in identifying and resolving problems in industrial automation

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare for building architecture	9	9	-	8
PC1. Obtain the design document and project develop requirements from the organization/OEM	1	1	-	1
PC2. Identify and select appropriate development tools, coding language, development platform, OS etc. as per the project requirements	3	2	-	2
PC3. Evaluate the IIOT network requirement like node allotment, station setting	2	2	-	2
PC4. Identify and select the machines, automation system to be connected in the IIOT network	2	2	-	2
PC5. Identify the suitable communication model, topology to connect the machines & automation system	1	2	-	1
Interpret the various network parameters required as per design	6	6	-	4
PC6. Support in designing of wireless/wired network nodes while taking into consideration the varieties of IIOT sensors, I/O link, edge devices, cloud service, and other networking devices	2	2	-	1
PC7. Ensure appropriate wired/wireless connectivity protocols are applied for Machine-to-Machine communications	1	1	-	1
PC8. Ensure appropriate wired/wireless connectivity protocols are applied for edge device-cloud communications	1	1	-	1
PC9. Verify the network parameters like communication speed, network topology, node address of different devices in the IIOT network	2	2	-	1
Develop the network as per design requirements	17	19	-	6

PC10. Support team in building code and configure software, its components and their oriented design	2	2	-	1
PC11. Support team in configuring ports and interfaces, Sender-Receiver communication and ClientServer communication as per the requirement	2	2	-	1
PC12. Guide the team during assigning nodes to every device in the system	1	2	-	1
PC13. Monitor that the nodes are optimized appropriately as per design document	2	2	-	-
PC14. Validate codes of all the components of architecture to ensure required output	2	2	-	1
PC15. Approve network design based on industrial requirement	1	1	-	-
PC16. Evaluate regulatory aspects of shopfloor network such as permitted frequency bands, possible interference due to high voltage line	2	2	-	1
PC17. Design and develop networking dashboards used for network monitoring with help from edge computing devices	3	3	-	1
PC18. Monitor timelines/deadlines and host review meetings	1	2	-	-
PC19. Ensure that the team is documenting the final network architecture plan appropriately	1	1	-	
Monitor the systems and devices mapping in network	**8**	**6**	**-**	**2**
PC20. Support the team during selection of the devices & checking their compatibility with the network and system	1	1	-	1
PC21. Monitor the IIOT network parameters like node address, communication speed and their effect on the network	2	1	-	-
PC22. Monitor that the team is mapping the node address of devices connected in the IIOT network appropriately and as per the design document and organizational standards	1	1	-	-
PC23. Verify that defined security standards and encryptions are followed in the EDGE boards and DATA links and as per the design document	2	1	-	1

PC24. Support the team in conducting communication test across all devices in the IIOT Network	1	1	-	
PC25. Record the healthy status of all devices & report to organizational project review committee	1	1	-	
NOS Total	**40**	**40**	**-**	**20**

ASC/N6447: Manage integration of machineries / Automation Systems in Healthy Communication via IIOT Sensor

Description

This NOS unit is about performing task related to integration of machines and automation systems using industrial networking protocols, IIOT devices used in manufacturing processes to meet the specification set by the organization.

Scope
The Scope Covers the following:
- Support in installation of the elements in different layers of industrial network architecture & protocols
- Establish communication between systems using IIOT Sensors, I/O link master and IIOT EDGE Computing Devices
- Ensure IIOT Network security among machineries & automation systems

Elements and Performance Criteria (PC)

Support in installation of the elements in different layers of industrial network architecture & protocols
To be competent, the user/individual on the job must be able to:

PC1. Prepare an integration plan to map devices and systems as per network design document

PC2. Interpret the installed machines, automation elements, system, and robots into different layers of network architecture like field devices, control devices as per network design

PC3. Verify the network consists of devices, automation system and robots

PC4. Guide the team to select suitable network protocols like MODBUS, CC-LINK, Profinet, Profibus, OPC UA, MQTT etc. based on control system requirements

PC5. Ensure that team has connected the intelligent devices and system using suitable network topology like STAR, LINE, RING as per network design document

PC6. Monitor the activities related to installation of the systems on the pre-planned locations to distribute the network for max connectivity and reach

PC7. Verify the systems & devices integrated as per design documents

PC8. Guide the team during verification of the connections of IIoT Sensors, I/O-Links to the machines, robots Automation systems with the appropriate Network Protocol Like OPC UA, Mod Bus

Establish communication between systems using IIOT Sensors, I/O Link Master & IIOT EDGE Computing Devices

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

PC9. Ensure that the automation elements like sensors, control devices to I/O link master are connected as per SOP

PC10. Establish the communication between automation system, machines, and robots by doing parameter setting like baud rate, distance, node ID and node type

PC11. Support the team in setting of the network parameters of automation system on the device manufacturers software as per SOP and organizational guidelines

PC12. Verify the Node-wise Communication having IIOT sensors, edge computing devices

PC13. Initiate the communication between Nodes in the IIOT Network like Machine-to-Machine Communication and ensure healthy communication between them

PC14. Configure the EDGE devices as per the IIOT network configuration

PC15. Guide the team to establish healthy communication between machines/devices and check for device duplicate

PC16. Support the team during testing of the functioning of backup systems, power connectivity and security access to the EDGE devices from both online and offline mode

PC17. Manage the activities related to server allotment and database for cloud computing

Ensure IIOT Network security among machineries & automation systems

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

PC18. Ensure physical security of the network contains IIOT Edge Devices, IIOT Sensors, Machines, Robots and Automation System

PC19. Guide the team to verify the physical security and environment for the hardware for hasslefree operations

PC20. Monitor that the network is protected from unauthorized access or malicious internet

PC21. Ensure only authorized devices should be able to connect to the network

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. Software and 3D tools used in organisation.

KU3. Network Security Protocols

KU4. Safe operation of electronic equipment like computers, robotic systems etc.

KU5. Relevant standards, procedures and policies related to robotic operations followed in the company.

KU6. Data safety and Non-Discloser's Norms.

KU7. Cyber safety and Work Confidentiality good practices.

KU8. E-Plan as per Customer Requirement.

KU9. Team cohesion and collaborative working.

KU10. IIOT Sensors Connection Details

Generic Skills (GS)

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

GS1. Write basic level notes and observations.

GS2. Modify work practices to improve them.

GS3. Note down observations related to the process.

GS4. Write information documents to internal departments and internal teams.

GS5. Monitoring of tasks completion efficiently and accurately within stipulated time.

GS6. Persuade team members to follow all guidelines and improvement procedures.

GS7. Make timely decisions for efficient utilization of resources.

GS8. Be punctual and utilize time efficiently.

GS9. Follow shop floor rules and avoid deviations.

GS10. Encourage self and other to take greater responsibilities in the task.

GS11. Question the process head in order to understand the activity.

GS12. Do what is right, not what is a popular practice.

GS13. Lead by example in plant premises and work area.

GS14. Ensure self-discipline and cleanliness on daily basis.

GS14. Use common sense and knowledge in day-to-day decision making.

GS15. Accept additional responsibilities to provide more flexibility to the team.

GS16. Use reasoning skills in identifying and resolving problems in industrial automation.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Support in installation of the elements in different layers of industrial network architecture & protocols	20	16	-	8
PC1. Prepare an integration plan to map devices and systems as per network design document	2	1	-	1
PC2. Interpret the installed machines, automation elements, system, and robots into different layers of network architecture like field devices, control devices as per network design	3	1	-	1
PC3. Verify the network consists of devices, automation system and robots	3	2	-	1
PC4. Guide the team to select suitable network protocols like MODBUS, CC-LINK, Profinet, Profibus, OPC UA, MQTT etc. based on control system requirements	3	1	-	1
PC5. Ensure that team has connected the intelligent devices and system using suitable network topology like STAR, LINE, RING as per network design document	2	3	-	1
PC6. Monitor the activities related to installation of the systems on the preplanned locations to distribute the network for max connectivity and reach	3	3	-	1
PC7. Verify the systems & devices integrated as per design documents	2	3	-	1
PC8. Guide the team during verification of the connections of IIoT Sensors, I/O-Links to the machines, robots Automation systems with the appropriate Network Protocol Like OPC UA, Mod Bus	2	2	-	1
Establish communication between systems using IIOT Sensors, I/O Link Master & IIOT EDGE Computing Devices	15	17	-	8
PC9. Ensure that the automation elements like sensors, control devices to I/O link master are connected as per SOP	2	2	-	1

PC10. Establish the communication between automation system, machines, and robots by doing parameter setting like baud rate, distance, node ID and node type	2	2	-	1
PC11. Support the team in setting of the network parameters of automation system on the device manufacturers software as per SOP and organizational guidelines	2	2	-	1
PC12. Verify the Node-wise Communication having IIOT sensors, edge computing devices	2	2	-	1
PC13. Initiate the communication between Nodes in the IIOT Network like Machine-to-Machine Communication and ensure healthy communication between them	3	2	-	1
PC14. Configure the EDGE devices as per the IIOT network configuration	1	1	-	1
PC15. Guide the team to establish healthy communication between machines/devices and check for device duplicate	1	2	-	-
PC16. Support the team during testing of the functioning of backup systems, power connectivity and security access to the EDGE devices from both online and offline mode	1	2	-	1
PC17. Manage the activities related to server allotment and database for cloud computing	1	2	-	1
Ensure IIOT Network security among machineries & automation systems	5	7	-	4
PC18. Ensure physical security of the network contains IIOT Edge Devices, IIOT Sensors, Machines, Robots and Automation System	1	2	-	1
PC19. Guide the team to verify the physical security and environment for the hardware for hassle-free operations	2	2	-	1
PC20. Monitor that the network is protected from unauthorized access or malicious internet	1	2	-	1
PC21. Ensure only authorized devices should be able to connect to the network	1	1	-	1
NOS Total	40	40	-	20

ASC/N6448: Use analytics, edge & cloud computing technologies to make predictions on production & machineries.

Description

This NOS unit is about to perform prediction of Production Process, Machineries Using Analytics, Edge & Cloud Computing Technologies.

Scope

The Scope Covers the following: -

- Fetch the process and machine data using edge computing devices
- Use of statistical tools to organize and analyze the data
- Apply algorithm to make predictions using cloud computing technologies

Elements and Performance Criteria (PC)

Fetch the process and machine data using edge computing devices To
be competent, the user/individual on the job must be able to:

PC1. Identify the relevant source of data from machines and process

PC2. Select the machine communication protocol as per design document

PC3. Check for duplicate data & validate it

PC4. Monitor the process using edge computing devices like production or machine status **PC5.**
Customize the edge computing device dashboard as per customer requirement

Use of statistical tools to organize and analyse the data
To be competent, the user/individual on the job must be able to:

PC6. Select appropriate statistical tools for data analysis

PC7. Apply the statistical tools like regression, standard deviation on the data to analyse the trend and patterns

PC8. Perform inferential or descriptive analysis on the data to extrapolate

PC9. Find correlation amongst the selected attributes of the data and statistical proposition

Apply algorithm to make predictions using cloud computing technologies
To be competent, the user/individual on the job must be able to:

PC10. Analyse the data and trends, then create a model on that using algorithm

PC11. Fetch the model into the cloud servers

PC12. Enable the client services to access data from cloud domain

PC13. Make predictions on production process, machine status by access the model from cloud domain

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Safe operation of electronic equipment like computers, robotic systems etc.

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

KU3. Data safety and Non-Discloser's Norms.

KU4. Cyber safety and Work Confidentiality good practices.

KU5. Data and folder standards.

KU6. Statistical Tools to organize and analyze the data

KU7. Algorithm to make predictions using cloud computing technologies **KU8.** Team cohesion and collaborative working.

KU9. Types of Data Algorithm, Statistical Tools

KU10. Cloud Services-Servers, Clients, Network Protocols, Remote Servers

Generic Skills (GS)

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

GS1. Modify work practices to improve them.

GS2. Note down observations related to the process.

GS3. Write information documents to internal departments and internal teams.

GS4. Monitoring of tasks completion efficiently and accurately within stipulated time.

GS5. Persuade team members to follow all guidelines and improvement procedures.

GS6. Make timely decisions for efficient utilization of resources.

GS7. Be punctual and utilize time efficiently.

GS8. Follow shop floor rules and avoid deviations.

GS9. Encourage self and other to take greater responsibilities in the task.

GS10. Question the process head in order to understand the activity.

GS11. Do what is right, not what is a popular practice.

GS12. Lead by example in plant premises and work area.

GS13. Ensure self-discipline and cleanliness on daily basis.

GS14. Use common sense and knowledge in day-to-day decision making.

GS15. Accept additional responsibilities in order to provide more flexibility to the team.

GS16. Use reasoning skills in identifying and resolving problems in industrial automation.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Fetch the process and machine data using edge computing devices	**13**	**13**		**7**
PC1. Identify the relevant source of data from machines and process	2	2		2
PC2. Select the machine communication protocol as per design document	3	3		2
PC3. Check for duplicate data & validate it	3	3		1
PC4. Monitor the process using edge computing devices like production or machine status	2	2		1
PC5. Customize the edge computing device dashboard as per customer requirement	3	3		1
Use statistical tools to organize and analyse the data	**14**	**14**		**7**
PC6. Select appropriate statistical tools for data analysis	3	3		2
PC7. Apply the statistical tools like regression, standard deviation on the data to analyse the trend and patterns	4	4		2
PC8. Perform inferential or descriptive analysis on the data to extrapolate	4	4		2
PC9. Find correlation amongst the selected attributes of the data and statistical proposition	3	3		1
Apply algorithm to make predictions using cloud computing technologies	**13**	**13**		**6**
PC10. Analyse the data and trends, then create a model on that using algorithm	4	4		2
PC11. Fetch the model into the cloud servers	3	3		1
PC12. Enable the client services to access data from cloud domain	3	3		1
PC13. Make predictions on production process, machine status by access the model from cloud domain	3	3		2
NOS Total	**40**	**40**	**-**	**20**

ASC/N8332: 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.   analyze 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-discloser's 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 organization

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 error

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		1
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		1
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

PC10. define information flow among the team members related to the new technology of robotic automation	4	4		2
NOS Total	40	40	-	20

DGT/VSQ/N0104 : Employability Skills (120 Hours)

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship Becoming a
- Professional in the 21st Century Basic English
- Skills

- Career Development & Goal Setting
- Communication Skills

- Diversity & Inclusion Financial
- and Legal Literacy Essential
- Digital Skills Entrepreneurship
-
- Customer Service

- Getting ready for Apprenticeship & Jobs

Elements and Performance Criteria

Introduction to Employability Skills

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

PC1. understand the significance of employability skills in meeting the current job market requirement and future of work

PC2. identify and explore learning and employability relevant portals

PC3. research about the different industries, job market trends, latest skills required and the available opportunities *Constitutional values – Citizenship*

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

PC4. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. for personal growth and the nation's progress

PC5. follow personal values and ethics such as honesty, integrity, caring and respecting others, etc.

PC6. follow and promote environmentally sustainable practices

Becoming a Professional in the 21st Century

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

PC7. recognize the significance of 21st Century Skills for employment

PC8. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life

PC9. adopt a continuous learning mindset for personal and professional development

Basic English Skills

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

PC10. use English as a medium of formal and informal communication while dealing with topics of everyday conversation in different contexts

PC11. speak over the phone in English, in an audible manner, using appropriate greetings, opening, and closing statements both on personal and work front

PC12. read and understand routine information, notes, instructions, mails, letters etc. written in English

PC13. write short messages, notes, letters, e-mails etc., using accurate English

Career Development & Goal Setting

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

PC14. identify career goals based on the skills, interests, knowledge, and personal attributes

PC15. prepare a career development plan with short- and long-term goals

Communication Skills

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

PC16. follow verbal and non-verbal communication etiquette while communicating in professional and public settings

PC17. use active listening techniques for effective communication

PC18. communicate in writing using appropriate style and format based on formal or informal requirements

PC19. work collaboratively with others in a team

Diversity & Inclusion

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

PC20. ensure personal behaviour, conduct, and use appropriate communication by taking gender into consideration

PC21. empathize with a PwD and aid a PwD, if asked

PC22. escalate any issues related to sexual harassment at the workplace in accordance with the POSH Act

Financial and Legal Literacy

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

PC23. identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc.

PC24. carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook

PC25. identify common components of salary and compute income, expenses, taxes, investments etc

PC26. identify relevant rights and laws and use legal aids to fight against legal exploitation

Essential Digital Skills

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

PC27. operate digital devices and use their features and applications securely and safely

PC28. carry out basic internet operations by connecting to the internet safely and securely, using the mobile data or other available networks through Bluetooth, Wi-Fi, etc.

PC29. display responsible online behaviour while using various social media platforms

PC30. create a personal email account, send and process received messages as per requirement

PC31. carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications

PC32. utilize virtual collaboration tools to work effectively

Entrepreneurship

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

PC33. identify different types of Entrepreneurship and Enterprises

PC34. use research and networking skills to identify and assess opportunities for potential business

PC35. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion

PC36. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

Customer Service

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

PC37. identify different types of customers

PC38. identify and respond to customer requests and needs in a professional manner

PC39. use appropriate tools to collect customer feedback

PC40. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

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

PC41. create a professional Curriculum vitae (Résumé)

PC42. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively

PC43. apply to identified job openings using offline /online methods as per requirement

PC44. answer questions politely, with clarity and confidence, during recruitment and selection

PC45. identify apprenticeship opportunities and register for it as per guidelines and requirements

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1.   need for employability skills
KU2.   different learning and employability related portals
KU3.   various constitutional and personal values
KU4.   different environmentally sustainable practices and their importance
KU5.   Twenty first (21st) century skills and their importance

KU6.   how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up
KU7.   importance of career development and setting long- and short-term goals
KU8.   Do's and don'ts of effective communication
KU9.   POSH Act
KU10. inclusivity and its importance
KU11. different types of disabilities and appropriate verbal and non-verbal communication and behaviour towards PwD
KU12. different types of financial institutes, products, and services
KU13. components of salary and how to compute income and expenditure
KU14. importance of maintaining safety and security in offline and online financial transactions
KU15. different legal rights and laws
KU16. different types of digital devices and the procedure to operate them safely and securely
KU17. how to create and operate an e- mail account
KU18. use applications such as word processors, spreadsheets etc.
KU19. different types of Enterprises and ways to identify business opportunities
KU20. types and needs of customers
KU21. how to apply for a job and prepare for an interview
KU22. apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

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

GS1. read and write different types of documents/instructions/correspondence in English and other languages
GS2. communicate effectively using appropriate language in formal and informal settings
GS3. behave politely and appropriately with all to maintain effective work relationship
GS4. how to work in a virtual mode, using various technological platforms
GS5. perform calculations efficiently
GS6. solve problems effectively
GS7. pay attention to details

GS8. manage time efficiently

GS9. maintain hygiene and sanitization to avoid infection

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Introduction to Employability Skills	**1**	**1**	**-**	**-**
PC1. understand the significance of employability skills in meeting the current job market requirement and future of work	-	-	-	-
PC2. identify and explore learning and employability relevant portals	-	-	-	-
PC3. research about the different industries, job market trends, latest skills required and the available opportunities	-	-	-	-
Constitutional values – Citizenship	**2**	**1**	**-**	**-**
PC4. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. for personal growth and the nation's progress	-	-	-	-
PC5. follow personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
PC6. follow and promote environmentally sustainable practices	-	-	-	-
Becoming a Professional in the 21st Century	**2**	**3**	**-**	**-**
PC7. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC8. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-

	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC9. adopt a continuous learning mindset for personal and professional development	-	-	-	-
Basic English Skills	2	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. use English as a medium of formal and informal communication while dealing with topics of everyday conversation in different contexts	-	-	-	-
PC11. speak over the phone in English, in an audible manner, using appropriate greetings, opening, and closing statements both on personal and work front	-	-	-	-
PC12. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC13. write short messages, notes, letters, e-mails etc., using accurate English	-	-	-	-
Career Development & Goal Setting	1	2	-	-
PC14. identify career goals based on the skills, interests, knowledge, and personal attributes	-	-	-	-
PC15. prepare a career development plan with short- and long-term goals	-	-	-	-
Communication Skills	2	3	-	-
PC16. follow verbal and non-verbal communication etiquette while communicating in professional and public settings	-	-	-	-
PC17. use active listening techniques for effective communication	-	-	-	-
PC18. communicate in writing using appropriate style and format based on formal or informal requirements	-	-	-	-
PC19. work collaboratively with others in a team	-	-	-	-

Diversity & Inclusion	1	2	-	-
PC20. • ensure personal behaviour, conduct, and use appropriate communication by taking gender into • consideration	-	-	-	-
PC21. empathize with a PwD and aid a PwD, if asked	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC22. escalate any issues related to sexual harassment at the workplace in accordance with the POSH Act	-	-	-	-
Financial and Legal Literacy	2	3	-	-
PC23. identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc.	-	-	-	-
PC24. carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook	-	-	-	-
PC25. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC26. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
Essential Digital Skills	2	3	-	-
PC27. operate digital devices and use their features and applications securely and safely	-	-	-	-
PC28. carry out basic internet operations by connecting to the internet safely and securely, using the mobile data or other available networks through Bluetooth, Wi-Fi, etc.	-	-	-	-
PC29. display responsible online behaviour while using various social media platforms	-	-	-	-

	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC30. create a personal email account, send and process received messages as per requirement	-	-	-	-
PC31. carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications	-	-	-	-
PC32. utilize virtual collaboration tools to work effectively	-	-	-	-
Entrepreneurship	**2**	**3**	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC33. identify different types of Entrepreneurship and Enterprises	-	-	-	-
PC34. use research and networking skills to identify and assess opportunities for potential business	-	-	-	-
PC35. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC36. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
Customer Service	**1**	**2**	-	-
PC37. identify different types of customers	-	-	-	-
PC38. identify and respond to customer requests and needs in a professional manner	-	-	-	-
PC39. use appropriate tools to collect customer feedback	-	-	-	-
PC40. follow appropriate hygiene and grooming standards	-	-	-	-
Getting ready for apprenticeship & Jobs	**2**	**4**	-	-

PC41. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC42. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC43. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
PC44. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC45. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
NOS Total	**20**	**30**	-	-

Parameters

NOS Code	DGT/VSQ/N0104
NOS Name	Employability Skills (120 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	6
Credits	4
Minimum Educational Qualification & Experience	
Version	1.0
Last Reviewed Date	27/05/2021
Next Review Date	27/05/2024
NSQC Clearance Date	27/05/2021
NQR Version	1.0