Automobile Lead Technician (Diagnostics)

Semester 5: Electric Four-Wheeler Technology (BEV and Hybrid)/ Semester 5: Heavy Electric Vehicle Technology (BUS and Trucks) / Semester 6: Value Added Services/ Semester 6: Specialized Vehicles/ Semester 6: Artificial Intelligence in Automotive Service

QP Code: ASC/Q1445

Version: 1.0

NSQF Level: 4.5

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ASC/Q1445: Automobile Lead Technician (Diagnostics)

Brief Job Description

The Automobile Diagnostic Lead Technician is responsible for leading diagnostic efforts within an automotive repair facility. This role involves supervising a team of technicians, coordinating diagnostic activities, and ensuring accurate and efficient problem resolution. The Lead Technician plays a crucial role in maintaining high standards of diagnostic quality and customer satisfaction

Personal Attributes

The person should be organized, team-oriented and have the ability to work independently for long hours in adverse conditions. He should be result-oriented, keen observers and have an eye for detail and quality

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. ASC/N1304: Automobile Symptom Based Diagnosis
2. ASC/N1305: Automobile Electrical fault finding
3. ASC/N1306: Various Features of Vehicle Scanner
4. ASC/N9841: Best Industrial Practices
5. ASC/N1307: Noise Vibration Harshness Diagnosis
6. ASC/N1308: DTC based diagnosis
7. ASC/N1309: Fundamental of Automotive Open System Architecture
8. ASC/N9843: Environmental Studies
9. DGT/VSQ/N0104: Employability Skills (120 Hours)
10. ASC/N1310: Workshop Technology HCV (OJT)

Options*(Not mandatory):*

Option 1: Semester 5: Electric Four-Wheeler Technology (BEV and Hybrid)

1. ASC/N1311: Electric Four-Wheeler Technology (BEV and Hybrid)

Option 2: Semester 5: Heavy Electric Vehicle Technology (BUS and Trucks)

1. ASC/N1312: Heavy Electric Vehicle Technology (BUS and Trucks)

Option 3: Semester 6: Value Added Services

1. ASC/N1313: Value Added Services

Option 4: Semester 6: Specialized Vehicles

1. ASC/N1314: Specialized Vehicles

Option 5: Semester 6: Artificial Intelligence in Automotive Service

1. ASC/N1315: Artificial Intelligence in Automotive Service

Qualification Pack (QP) Parameters

Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Technical Service & Repair
Country	India
NSQF Level	4.5
Credits	40
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7213.0201
Minimum Educational Qualification & Experience	Certificate-NSQF (Automobile Technician (Diagnostics), Level-4)
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	NA
Next Review Date	NA
NSQC Approval Date	

Version	1.0

Remarks:

Mandatory: It is Mandatory to select at least one optional NOS in every semester to meet the 40 credits requirement in a year for diploma progression (As per NCVET Diploma guidelines)

ASC/N1304: Automobile Symptom Based Diagnosis

Description

This unit describes innovative approaches to automobile symptom-based diagnosis before carrying out service and repair an automobile.

Scope

The scope covers the following :

- Possessing Expertise in Identifying Symptoms.
- Prioritizing Diagnostic Procedures.
- Approaching Diagnosis Comprehensively.

Elements and Performance Criteria

Possessing Expertise in Identifying Symptoms

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

PC1. Exemplifying expertise in identifying symptoms by conducting thorough diagnostic evaluations to pinpoint underlying vehicle issues accurately

PC2. Demonstrating proficiency in interpreting diagnostic data and utilizing advanced tools to swiftly identify symptoms indicative of mechanical or electrical malfunctions

PC3. Leveraging extensive experience to train junior technicians on effective techniques for recognizing symptoms, ensuring comprehensive and precise diagnosis of vehicle problems

Prioritizing Diagnostic Procedures

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

PC4. Establishing clear priorities for diagnostic procedures based on vehicle symptoms and customer concerns to expedite troubleshooting and minimize downtime

PC5. Allocating resources effectively by assigning skilled technicians to prioritize diagnostic procedures for complex or urgent repair cases

PC6. Implementing a structured approach to prioritize diagnostic procedures, ensuring that critical issues are addressed promptly and efficiently to maintain customer satisfaction and safety

Approaching Diagnosis Comprehensively

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

PC7. Approach diagnosis comprehensively by meticulously inspecting all vehicle systems, using advanced diagnostic tools to identify potential issues accurately

PC8. Analyze diagnostic data systematically, correlating symptoms with potential causes to develop a comprehensive understanding of the vehicle's condition and prioritize troubleshooting steps effectively

PC9. Foster collaboration among team members, sharing insights and coordinating efforts to approach diagnosis comprehensively, ensuring no aspect of the vehicle's operation is overlooked

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Spearhead the development of a comprehensive database integrating symptom-based diagnosis for streamlined automobile troubleshooting

KU2. Implement cutting-edge diagnostic tools to enhance accuracy and efficiency in identifying automotive issues

KU3. Lead training sessions for technicians, imparting knowledge on advanced diagnostic techniques and methodologies

KU4. Initiate regular brainstorming sessions with the team to explore novel approaches to symptom-based diagnosis

KU5. Collaborate with software developers to customize diagnostic software tailored to the needs of automobile technicians

KU6. Establish protocols for conducting thorough symptom analysis, ensuring consistent and reliable diagnosis

KU7. Proactively research emerging trends in automotive technology to stay ahead of industry advancements

KU8. Coordinate with manufacturers to access technical specifications and troubleshooting guidelines for specific vehicle models

KU9. Organize workshops and seminars to share expertise and foster a culture of continuous learning among technicians

KU10. Advocate for the integration of artificial intelligence and machine learning algorithms to enhance diagnostic capabilities and predictive maintenance in automobile diagnosis

Generic Skills (GS)

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

GS1. read and interpret workplace related documentation

GS2. interpret the needs of customers by understanding the key issues

GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. identify potential workplace problem and take suitable action

GS6. write in English/regional language

GS7. read various sources of information available for assessing service and repair requirements.

GS8. Read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates

GS9. Communicate effectively at the workplace

GS10. Plan work according to the required schedule and location

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Possessing Expertise in Identifying Symptoms	**10**	**20**	**20**	**-**
PC1. Exemplifying expertise in identifying symptoms by conducting thorough diagnostic evaluations to pinpoint underlying vehicle issues accurately	-	-	-	-
PC2. Demonstrating proficiency in interpreting diagnostic data and utilizing advanced tools to swiftly identify symptoms indicative of mechanical or electrical malfunctions	-	-	-	-
PC3. Leveraging extensive experience to train junior technicians on effective techniques for recognizing symptoms, ensuring comprehensive and precise diagnosis of vehicle problems	-	-	-	-
Prioritizing Diagnostic Procedures	**5**	**10**	**10**	**-**
PC4. Establishing clear priorities for diagnostic procedures based on vehicle symptoms and customer concerns to expedite troubleshooting and minimize downtime	-	-	-	-
PC5. Allocating resources effectively by assigning skilled technicians to prioritize diagnostic procedures for complex or urgent repair cases	-	-	-	-
PC6. Implementing a structured approach to prioritize diagnostic procedures, ensuring that critical issues are addressed promptly and efficiently to maintain customer satisfaction and safety	-	-	-	-
Approaching Diagnosis Comprehensively	**5**	**10**	**10**	**-**
PC7. Approach diagnosis comprehensively by meticulously inspecting all vehicle systems, using advanced diagnostic tools to identify potential issues accurately	-	-	-	-
PC8. Analyze diagnostic data systematically, correlating symptoms with potential causes to develop a comprehensive understanding of the vehicle's condition and prioritize troubleshooting steps effectively	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC9. Foster collaboration among team members, sharing insights and coordinating efforts to approach diagnosis comprehensively, ensuring no aspect of the vehicle's operation is overlooked	-	-	-	-
NOS Total	**20**	**40**	**40**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1304
NOS Name	Automobile Symptom Based Diagnosis
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Automotive Service & Repair
NSQF Level	4.5
Credits	1.5
Version	1.0
Next Review Date	NA

ASC/N1305: Automobile Electrical fault finding

Description

This unit describes thorough inspections to carry out an automobiles electric fault finding.

Scope

The scope covers the following :

- Utilizing Advanced Diagnostic Equipment.
- Systematic Approach to Fault Finding.
- Interpreting Diagnostic Data and Troubleshooting

Elements and Performance Criteria

Utilizing Advanced Diagnostic Equipment

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

PC1. Employ cutting-edge diagnostic equipment to swiftly pinpoint electric faults, ensuring efficient troubleshooting and minimal vehicle downtime

PC2. Harness the power of advanced diagnostic tools to systematically analyze electrical systems, facilitating accurate fault identification and expedited repair solutions

PC3. Spearhead the implementation of innovative diagnostic technologies, empowering the team to effectively diagnose and resolve complex electric issues with precision and confidence

Systematic Approach to Fault Finding

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

PC4. Leading the way with diagnostic team in meticulously analyzing diagnostic data, utilizing advanced scanning tools and techniques to pinpoint potential faults accurately and efficiently

PC5. Develop standardized procedures for systematically identifying electric faults in vehicles, ensuring consistent and efficient diagnosis across all cases.

PC6. Implement a step-by-step approach to electric fault finding, beginning with thorough visual inspections and progressing methodically through electrical system tests using diagnostic tools.

PC7. Train and mentor junior technicians in the systematic approach to electric fault finding, empowering them to confidently diagnose and resolve electrical issues in vehicles

Interpreting Diagnostic Data and Troubleshooting

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

PC8. Analyzing diagnostic data with precision and expertise to pinpoint underlying electrical faults and malfunctions in vehicle systems

PC9. Employing advanced troubleshooting techniques to swiftly identify and resolve electrical issues, ensuring optimal performance and safety of vehicles

PC10. Leading diagnostic teams with proficiency in interpreting complex data, guiding efficient fault-finding processes, and delivering timely solutions for electrical system challenges

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Identify Symptoms: Begin by carefully observing and noting all symptoms exhibited by the vehicle's electrical system

KU2. Identify Symptoms: Begin by carefully observing and noting all symptoms exhibited by the vehicle's electrical system

KU3. Analyze Wiring Diagrams: Utilize wiring diagrams to comprehend the vehicle's electrical layout and identify potential problem areas

KU4. Test Components: Methodically test individual electrical components such as relays, fuses, switches, and sensors for functionality

KU5. Check Battery Health: Assess the battery's condition, voltage, and connections to ensure proper power supply to the electrical system

KU6. Inspect Ground Connections: Thoroughly examine all ground connections for corrosion, looseness, or damage that could impede electrical flow

KU7. Scan for Diagnostic Trouble Codes (DTCs): Utilize diagnostic tools to scan for DTCs stored in the vehicle's computer system to pinpoint specific issues

KU8. Perform Voltage Drop Tests: Conduct voltage drop tests across critical circuits to identify areas of excessive resistance or poor conductivity

KU9. Utilize Multimeter Readings: Employ a multimeter to measure voltage, current, and resistance at various points within the electrical system

KU10. Verify Continuity: Verify continuity within wiring harnesses and circuits to ensure proper connectivity and integrity

KU11. Record all findings, including identified faults and recommended solutions, to maintain a comprehensive record for future reference and to facilitate effective communication with the repair team

Generic Skills (GS)

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

GS1. read and interpret workplace related documentation

GS2. interpret the needs of customers by understanding the key issues

GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. identify potential workplace problem and take suitable action

GS6. write in English/regional language

GS7. Read various sources of information available for assessing service and repair requirements

GS8. Read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates

GS9. Communicate effectively at the workplace

GS10. Plan work according to the required schedule and location

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Utilizing Advanced Diagnostic Equipment	**10**	**20**	**20**	**-**
PC1. Employ cutting-edge diagnostic equipment to swiftly pinpoint electric faults, ensuring efficient troubleshooting and minimal vehicle downtime	-	-	-	-
PC2. Harness the power of advanced diagnostic tools to systematically analyze electrical systems, facilitating accurate fault identification and expedited repair solutions	-	-	-	-
PC3. Spearhead the implementation of innovative diagnostic technologies, empowering the team to effectively diagnose and resolve complex electric issues with precision and confidence	-	-	-	-
Systematic Approach to Fault Finding	**5**	**10**	**10**	**-**
PC4. Leading the way with diagnostic team in meticulously analyzing diagnostic data, utilizing advanced scanning tools and techniques to pinpoint potential faults accurately and efficiently	-	-	-	-
PC5. Develop standardized procedures for systematically identifying electric faults in vehicles, ensuring consistent and efficient diagnosis across all cases.	-	-	-	-
PC6. Implement a step-by-step approach to electric fault finding, beginning with thorough visual inspections and progressing methodically through electrical system tests using diagnostic tools.	-	-	-	-
PC7. Train and mentor junior technicians in the systematic approach to electric fault finding, empowering them to confidently diagnose and resolve electrical issues in vehicles	-	-	-	-
Interpreting Diagnostic Data and Troubleshooting	**5**	**10**	**10**	**-**
PC8. Analyzing diagnostic data with precision and expertise to pinpoint underlying electrical faults and malfunctions in vehicle systems	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC9. Employing advanced troubleshooting techniques to swiftly identify and resolve electrical issues, ensuring optimal performance and safety of vehicles	-	-	-	-
PC10. Leading diagnostic teams with proficiency in interpreting complex data, guiding efficient fault-finding processes, and delivering timely solutions for electrical system challenges	-	-	-	-
NOS Total	**20**	**40**	**40**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1305
NOS Name	Automobile Electrical fault finding
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Automotive Service & Repair
NSQF Level	4.5
Credits	1.5
Version	1.0
Next Review Date	NA

ASC/N1306: Various Features of Vehicle Scanner

Description

This unit describes exploring various features of vehicle scanner

Scope

The scope covers the following :

- Interpret the Compatibility of vehicle scanners with different makes and models.
- Evaluating Functionality of the various features of a vehicle scanner.
- Investing time in training and familiarization.

Elements and Performance Criteria

Interpret Compatibility of vehicle scanners with different makes and models.

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

PC1. Researching and evaluating compatibility specifications of vehicle scanners across diverse makes and models to ensure seamless integration and functionality

PC2. Conducting thorough testing and validation procedures to verify the effectiveness and accuracy of vehicle scanners across various automotive platforms.

PC3. Collaborating with manufacturers and industry experts to stay abreast of technological advancements and updates, enhancing the understanding of compatibility nuances for vehicle scanners across different makes and models

Prioritizing Diagnostic Procedures.

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

PC4. Perform thorough evaluations to assess the functionality and performance of all features of the vehicle scanner.

PC5. Identify and troubleshoot any discrepancies or inconsistencies in the functionality of specific features of the vehicle scanner.

PC6. Analyze the performance of advanced features such as live data streaming and component testing within the vehicle scanner to ensure optimal functionality and usability.

Investing time in training and familiarization

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

PC7. Dedicate sufficient time to training sessions to fully grasp the functionalities of the vehicle scanner.

PC8. Master the operation of the vehicle scanner through hands-on practice and guided instruction.

PC9. Practice using the vehicle scanner on different vehicle models to build confidence and proficiency.

PC10. Stay updated on software updates and advancements in vehicle scanner technology to enhance diagnostic capabilities.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Familiarize yourself with the interface to swiftly navigate through different scanning options
KU2. Experiment with different scanning modes to grasp their respective functionalities.
KU3. Practice interpreting scan results to identify potential issues or anomalies
KU4. Adjust scanner settings to optimize performance for specific vehicle types or conditions.
KU5. Engage in hands-on training sessions to master the use of advanced features.
KU6. Analyze scan data to develop insights into vehicle performance trends over time.
KU7. Share your findings with colleagues to foster collaborative learning and problem-solving.
KU8. Incorporate scanner usage into regular maintenance routines to ensure vehicle health and safety.
KU9. Troubleshoot scanner errors promptly to maintain uninterrupted operation.
KU10. Continuously update your knowledge by staying informed about advancements in scanner technology and best practices in the automotive industry

Generic Skills (GS)

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

GS1. read and interpret workplace related documentation
GS2. interpret the needs of customers by understanding the key issues
GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade
GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
GS5. identify potential workplace problem and take suitable action
GS6. write in English/regional language
GS7. read various sources of information available for assessing service and repair requirements.
GS8. Read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates
GS9. Communicate effectively at the workplace
GS10. Plan work according to the required schedule and location

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Interpret Compatibility of vehicle scanners with different makes and models.	**10**	**20**	**20**	**-**
PC1. Researching and evaluating compatibility specifications of vehicle scanners across diverse makes and models to ensure seamless integration and functionality	-	-	-	-
PC2. Conducting thorough testing and validation procedures to verify the effectiveness and accuracy of vehicle scanners across various automotive platforms.	-	-	-	-
PC3. Collaborating with manufacturers and industry experts to stay abreast of technological advancements and updates, enhancing the understanding of compatibility nuances for vehicle scanners across different makes and models	-	-	-	-
Prioritizing Diagnostic Procedures.	**5**	**10**	**10**	**-**
PC4. Perform thorough evaluations to assess the functionality and performance of all features of the vehicle scanner.	-	-	-	-
PC5. Identify and troubleshoot any discrepancies or inconsistencies in the functionality of specific features of the vehicle scanner.	-	-	-	-
PC6. Analyze the performance of advanced features such as live data streaming and component testing within the vehicle scanner to ensure optimal functionality and usability.	-	-	-	-
Investing time in training and familiarization	**5**	**10**	**10**	**-**
PC7. Dedicate sufficient time to training sessions to fully grasp the functionalities of the vehicle scanner.	-	-	-	-
PC8. Master the operation of the vehicle scanner through hands-on practice and guided instruction.	-	-	-	-
PC9. Practice using the vehicle scanner on different vehicle models to build confidence and proficiency.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. Stay updated on software updates and advancements in vehicle scanner technology to enhance diagnostic capabilities.	-	-	-	-
NOS Total	**20**	**40**	**40**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1306
NOS Name	Various Features of Vehicle Scanner
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Automotive Service & Repair
NSQF Level	4.5
Credits	1.5
Version	1.0
Next Review Date	NA

ASC/N9841: Best Industrial Practices

Description

This NOS is about to Maintain an organized and clean workshop, ensuring Best Industrial Practices.

Scope

The scope covers the following :

- Conduct regular inspections of the workshop to identify potential issues.
- Implement safety measures in the workshop.
- Develop a waste management plan

Elements and Performance Criteria

Conduct regular inspections of the workshop to identify potential issues

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

PC1. Create a regular inspection schedule that outlines the frequency and tasks for inspecting various areas of the workshop

PC2. Identify specific areas and checkpoints within the workshop that require regular inspection, such as equipment, tools, storage areas, and safety equipment.

PC3. Create a comprehensive checklist that covers all aspects of the workshop, including equipment functionality, cleanliness, safety measures, and potential hazards

PC4. Perform the scheduled inspections, following the established checklist and paying close attention to any signs of potential issues, such as equipment malfunctions, hazardous conditions, or clutter.

Implement safety measures in the workshop

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

PC5. Identify potential hazards in the workshop by conducting a thorough risk assessment.

PC6. Create a comprehensive safety policy that outlines the expectations and procedures for maintaining a safe workshop environment

PC7. Establish a policy for the use of personal protective equipment, such as gloves, goggles, hard hats, and safety shoes. Ensure that appropriate PPE is readily available and that employees are trained in its proper use.

PC8. Develop and communicate emergency response procedures, including evacuation plans, fire safety measures, and first aid protocols.

Develop a waste management plan

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

PC9. Establish specific, measurable, achievable, relevant, and time-bound (SMART) goals for reducing waste generation.

PC10. Categorize the different types of waste generated, such as paper, plastics, metals, glass, hazardous materials, and organic waste

PC11. Collaborate with waste management service providers, recycling companies, and other organizations to facilitate the efficient handling and disposal of waste.

PC12. Regularly monitor and evaluate the effectiveness of the waste management plan by tracking waste generation, recycling rates, and other relevant metrics.

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. Workshop Organization: Understand the importance of a well-organized workspace, including proper storage, labeling, and arrangement of tools and equipment. Know how to categorize and group items based on their frequency of use, type, and size

KU5. Safety Protocols: Have a thorough understanding of safety guidelines and protocols in the workshop, such as using personal protective equipment (PPE), maintaining proper ventilation, and following fire safety procedures.

KU6. Cleanliness and Hygiene: Know the importance of maintaining cleanliness in the workshop to prevent accidents, contamination, and the spread of germs. Understand proper cleaning techniques and the use of appropriate cleaning materials.

KU7. Industrial Practices: Be well-versed in best industrial practices related to workshop maintenance, such as regular equipment maintenance, proper disposal of hazardous waste, and adherence to environmental guidelines.

KU8. Time Management: Develop an understanding of efficient time management techniques to ensure tasks are completed in a timely manner, minimizing disruptions and downtime in the workshop.

KU9. Communication Skills: Understand the importance of clear communication among team members to ensure everyone is on the same page regarding workshop organization, cleanliness, and safety protocols.

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
Conduct regular inspections of the workshop to identify potential issues	**5**	**10**	**10**	**-**
PC1. Create a regular inspection schedule that outlines the frequency and tasks for inspecting various areas of the workshop	2	3	3	-
PC2. Identify specific areas and checkpoints within the workshop that require regular inspection, such as equipment, tools, storage areas, and safety equipment.	1	3	3	-
PC3. Create a comprehensive checklist that covers all aspects of the workshop, including equipment functionality, cleanliness, safety measures, and potential hazards	1	2	2	-
PC4. Perform the scheduled inspections, following the established checklist and paying close attention to any signs of potential issues, such as equipment malfunctions, hazardous conditions, or clutter.	1	2	2	-
Implement safety measures in the workshop	**5**	**10**	**10**	**-**
PC5. Identify potential hazards in the workshop by conducting a thorough risk assessment.	1	3	3	-
PC6. Create a comprehensive safety policy that outlines the expectations and procedures for maintaining a safe workshop environment	2	3	3	-
PC7. Establish a policy for the use of personal protective equipment, such as gloves, goggles, hard hats, and safety shoes. Ensure that appropriate PPE is readily available and that employees are trained in its proper use.	1	2	2	-
PC8. Develop and communicate emergency response procedures, including evacuation plans, fire safety measures, and first aid protocols.	1	2	2	-
Develop a waste management plan	**5**	**10**	**10**	**-**
PC9. Establish specific, measurable, achievable, relevant, and time-bound (SMART) goals for reducing waste generation.	2	3	3	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. Categorize the different types of waste generated, such as paper, plastics, metals, glass, hazardous materials, and organic waste	1	2	2	-
PC11. Collaborate with waste management service providers, recycling companies, and other organizations to facilitate the efficient handling and disposal of waste.	1	3	3	-
PC12. Regularly monitor and evaluate the effectiveness of the waste management plan by tracking waste generation, recycling rates, and other relevant metrics.	1	2	2	-
NOS Total	**15**	**30**	**30**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9841
NOS Name	Best Industrial Practices
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Generic
NSQF Level	4.5
Credits	3
Version	1.0
Last Reviewed Date	30/11/2023
Next Review Date	30/11/2026
NSQC Clearance Date	30/11/2023

ASC/N1307: Noise Vibration Harshness Diagnosis

Description

This unit describes innovative approaches to automobile symptom-based diagnosis before carrying out service and repair an automobile

Scope

The scope covers the following :

- Analyzing noise, vibration and harshness (NVH) patterns and characteristics using advanced diagnostic tools.
- Identifying sources of noise, vibration, and harshness (NVH)
- Implementing targeted interventions and adjustments to mitigate NVH issues.

Elements and Performance Criteria

Analyzing noise, vibration and harshness (NVH) patterns and characteristics using advanced diagnostic tools

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

PC1. Apply advanced methodologies to interpret NVH characteristics and provide actionable insights for resolution.

PC2. Employ precision measurement tools to quantify and document NVH levels accurately

PC3. Develop targeted strategies to mitigate NVH concerns, ensuring optimal vehicle performance and customer satisfaction.

PC4. Execute thorough NVH assessments to uphold quality standards and regulatory compliance in automotive diagnostics.

Identifying sources of noise, vibration, and harshness (NVH).

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

PC5. Investigate and conduct thorough inspections to pinpoint sources of noise, vibration, and harshness (NVH) in automobiles.

PC6. Assess data from sound level meters, accelerometers, and other instrumentation to isolate NVH culprits.

PC7. Maintain detailed records of NVH investigations, findings, and solutions for future reference and continuous improvement efforts.

Implementing targeted interventions and adjustments to mitigate NVH issues.

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

PC8. Identify specific NVH issues through comprehensive diagnostic tests and analysis

PC9. Develop tailored intervention strategies to address identified NVH concerns effectively.

PC10. Execute precise adjustments to vehicle components to minimize noise, vibration, and harshness.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Assess NVH Characteristics: Evaluate the noise, vibration, and harshness (NVH) characteristics of vehicles to identify potential sources of discomfort or malfunction

KU2. Utilize Diagnostic Equipment: Employ specialized diagnostic equipment such as microphones, accelerometers, and spectrum analyzers to pinpoint NVH issues accurately

KU3. Conduct Road Tests: Conduct comprehensive road tests to replicate and diagnose NVH concerns under real-world driving conditions

KU4. Analyze Frequency Spectrum: Analyze frequency spectra to isolate and identify specific vibration frequencies associated with NVH problems

KU5. Interpret Diagnostic Data: Interpret diagnostic data from vehicle sensors and onboard systems to diagnose underlying NVH issues effectively

KU6. Investigate Structural Dynamics: Investigate the structural dynamics of vehicle components to understand their contribution to NVH concerns.

KU7. Apply Modal Analysis Techniques: Apply modal analysis techniques to determine natural frequencies and mode shapes of vehicle structures affecting NVH performance.

KU8. Implement Noise Control Solutions: Develop and implement noise control solutions such as insulation materials or vibration damping treatments to mitigate NVH issues.

KU9. Collaborate with Engineering Teams: Collaborate with engineering teams to provide feedback and recommendations for NVH optimization in vehicle design and development

KU10. Train Technicians: Provide training and guidance to technicians on NVH diagnosis techniques and best practices to enhance diagnostic proficiency within the workshop.

Generic Skills (GS)

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

GS1. read and interpret workplace related documentation

GS2. interpret the needs of customers by understanding the key issues

GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. identify potential workplace problem and take suitable action

GS6. write in English/regional language

GS7. read various sources of information available for assessing service and repair requirements.

GS8. Read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates.

GS9. Communicate effectively at the workplace

GS10. Plan work according to the required schedule and location

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Analyzing noise, vibration and harshness (NVH) patterns and characteristics using advanced diagnostic tools	**10**	**20**	**20**	**-**
PC1. Apply advanced methodologies to interpret NVH characteristics and provide actionable insights for resolution.	-	-	-	-
PC2. Employ precision measurement tools to quantify and document NVH levels accurately	-	-	-	-
PC3. Develop targeted strategies to mitigate NVH concerns, ensuring optimal vehicle performance and customer satisfaction.	-	-	-	-
PC4. Execute thorough NVH assessments to uphold quality standards and regulatory compliance in automotive diagnostics.	-	-	-	-
Identifying sources of noise, vibration, and harshness (NVH).	**5**	**10**	**10**	**-**
PC5. Investigate and conduct thorough inspections to pinpoint sources of noise, vibration, and harshness (NVH) in automobiles.	-	-	-	-
PC6. Assess data from sound level meters, accelerometers, and other instrumentation to isolate NVH culprits.	-	-	-	-
PC7. Maintain detailed records of NVH investigations, findings, and solutions for future reference and continuous improvement efforts.	-	-	-	-
Implementing targeted interventions and adjustments to mitigate NVH issues.	**5**	**10**	**10**	**-**
PC8. Identify specific NVH issues through comprehensive diagnostic tests and analysis	-	-	-	-
PC9. Develop tailored intervention strategies to address identified NVH concerns effectively.	-	-	-	-
PC10. Execute precise adjustments to vehicle components to minimize noise, vibration, and harshness.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	**20**	**40**	**40**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1307
NOS Name	Noise Vibration Harshness Diagnosis
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Automotive Service & Repair
NSQF Level	4.5
Credits	1.5
Version	1.0
Next Review Date	NA

ASC/N1308: DTC based diagnosis

Description

This unit describes different ways in which we can establishing best practices for DTC-based diagnosis before carrying out service and repair an automobile.

Scope

The scope covers the following :

- Establishing a systematic and methodical diagnostic process.
- Utilization of Advanced Diagnostic Tools and Software.
- Identify DTCs to pinpoint the exact issue.

Elements and Performance Criteria

Establishing a systematic and methodical diagnostic process

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

PC1. Develop a comprehensive checklist for diagnosing DTCs, ensuring thoroughness in every inspection step.

PC2. Implement standardized procedures for scanning, interpreting, and analyzing DTCs across all vehicle models.

PC3. Train technicians rigorously on the latest diagnostic tools and software to enhance efficiency and accuracy.

PC4. Establish protocols for documenting diagnostic findings and recommended repairs for future reference.

Utilization of Advanced Diagnostic Tools and Software

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

PC5. Identify and decode DTCs using advanced scanning tools and diagnostic software.

PC6. Analyze DTCs to pinpoint the root cause of vehicle malfunctions accurately

PC7. Utilize cutting-edge diagnostic tools to swiftly identify and resolve DTCs, enhancing vehicle performance and reliability.

PC8. Employ sophisticated software to analyze intricate DTC patterns, streamlining diagnosis processes for optimal efficiency

PC9. Empower team members on using the latest diagnostic technologies, empowering them to confidently tackle complex vehicle issues.

Identify Diagnostic Trouble Codes (DTCs) to pinpoint the exact issue

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

PC10. Quickly recognize DTCs to pinpoint the exact issue

PC11. Thoroughly examine DTCs to determine root causes and potential related issues

PC12. Skillfully interpret DTCs to understand their significance in the context of vehicle systems

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Analyze diagnostic trouble codes (DTCs) to pinpoint specific vehicle issues accurately

KU2. Implement standardized procedures for interpreting DTCs across different vehicle makes and models.

KU3. Lead training sessions to educate technicians on effective DTC-based diagnosis techniques

KU4. Develop a comprehensive database of common DTCs and their corresponding diagnostic procedures

KU5. Collaborate with engineers and manufacturers to refine diagnostic procedures based on real-world data

KU6. Implement advanced diagnostic tools and software to streamline DTC-based diagnosis processes.

KU7. Continuously monitor industry trends and updates in DTC standards to ensure best practices are up-to-date.

KU8. Establish protocols for prioritizing and addressing DTCs based on severity and impact on vehicle performance

KU9. Conduct regular audits and reviews of diagnostic procedures to identify areas for improvement

KU10. Foster a culture of continuous learning and improvement among diagnostic technicians to enhance DTC-based diagnosis capabilities

Generic Skills (GS)

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

GS1. read and interpret workplace related documentation

GS2. interpret the needs of customers by understanding the key issues

GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. identify potential workplace problem and take suitable action

GS6. write in English/regional language

GS7. read various sources of information available for assessing service and repair requirements

GS8. Read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates

GS9. Communicate effectively at the workplace

GS10. Plan work according to the required schedule and location

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Establishing a systematic and methodical diagnostic process	**10**	**20**	**20**	**-**
PC1. Develop a comprehensive checklist for diagnosing DTCs, ensuring thoroughness in every inspection step.	-	-	-	-
PC2. Implement standardized procedures for scanning, interpreting, and analyzing DTCs across all vehicle models.	-	-	-	-
PC3. Train technicians rigorously on the latest diagnostic tools and software to enhance efficiency and accuracy.	-	-	-	-
PC4. Establish protocols for documenting diagnostic findings and recommended repairs for future reference.	-	-	-	-
Utilization of Advanced Diagnostic Tools and Software	**5**	**10**	**10**	**-**
PC5. Identify and decode DTCs using advanced scanning tools and diagnostic software.	-	-	-	-
PC6. Analyze DTCs to pinpoint the root cause of vehicle malfunctions accurately	-	-	-	-
PC7. Utilize cutting-edge diagnostic tools to swiftly identify and resolve DTCs, enhancing vehicle performance and reliability.	-	-	-	-
PC8. Employ sophisticated software to analyze intricate DTC patterns, streamlining diagnosis processes for optimal efficiency	-	-	-	-
PC9. Empower team members on using the latest diagnostic technologies, empowering them to confidently tackle complex vehicle issues.	-	-	-	-
Identify Diagnostic Trouble Codes (DTCs) to pinpoint the exact issue	**5**	**10**	**10**	**-**
PC10. Quickly recognize DTCs to pinpoint the exact issue	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. Thoroughly examine DTCs to determine root causes and potential related issues	-	-	-	-
PC12. Skillfully interpret DTCs to understand their significance in the context of vehicle systems	-	-	-	-
NOS Total	**20**	**40**	**40**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1308
NOS Name	DTC based diagnosis
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Automotive Service & Repair
NSQF Level	4.5
Credits	1.5
Version	1.0
Next Review Date	NA

ASC/N1309: Fundamental of Automotive Open System Architecture

Description

This unit describes how we can lead the integration of fundamentals of automotive open system architecture

Scope

The scope covers the following :

- Implementing System Interoperability.
- Standardization of Diagnostic Protocols.
- Adherence to AUTOSAR Architecture.

Elements and Performance Criteria

Implementing System Interoperability

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

PC1. Incorporate the essential layers of the Open System Architecture (OSA) into existing diagnostic frameworks.

PC2. Configure interfaces to ensure compatibility and smooth data exchange between different components.

PC3. Engineer solutions capable of bridging the gap between diverse operating systems within the automotive ecosystem.

PC4. Improve data parsing algorithms to effectively interpret and utilize diagnostic information across interconnected systems.

Standardization of Diagnostic Protocols

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

PC5. Ensure consistent use of diagnostic procedures across all automotive systems

PC6. Simplify and optimize the steps involved in diagnosing automotive issues

PC7. Improve the compatibility and communication between various diagnostic tools and systems.

PC8. Provide comprehensive training to technicians to effectively utilize standardized diagnostic procedures.

PC9. Align diagnostic protocols with established automotive industry standards and regulations.

Adherence to AUTOSAR Architecture

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

PC10. Study and comprehend the key principles and components of AUTOSAR architecture to ensure seamless integration

PC11. Enforce strict adherence to AUTOSAR standards throughout the integration process to maintain system integrity and reliability

PC12. Regularly assess the integration of AUTOSAR principles with automotive open system architecture to identify and address any discrepancies or inefficiencies

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Develop comprehensive understanding of automotive open system architecture principles
KU2. Spearhead the integration of open system architecture into diagnostic processes
KU3. Implement protocols for seamless communication between vehicle subsystems
KU4. Coordinate training sessions to educate technicians on open system architecture fundamentals
KU5. Establish standardized procedures for diagnosing interconnected vehicle systems
KU6. Collaborate with software engineers to develop diagnostic tools compatible with open architectures.
KU7. Analyze data exchange protocols to ensure efficient communication between components
KU8. Lead cross-functional teams in brainstorming innovative diagnostic approaches leveraging open system architecture.
KU9. Stay abreast of industry standards and advancements in automotive open system architecture.
KU10. Drive continuous improvement initiatives to optimize diagnostic efficiency and accuracy within the workshop.

Generic Skills (GS)

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

GS1. read and interpret workplace related documentation
GS2. interpret the needs of customers by understanding the key issues
GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade
GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
GS5. identify potential workplace problem and take suitable action
GS6. write in English/regional language
GS7. read various sources of information available for assessing service and repair requirements
GS8. Read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates
GS9. Communicate effectively at the workplace
GS10. Plan work according to the required schedule and location

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Implementing System Interoperability	**10**	**20**	**20**	**-**
PC1. Incorporate the essential layers of the Open System Architecture (OSA) into existing diagnostic frameworks.	-	-	-	-
PC2. Configure interfaces to ensure compatibility and smooth data exchange between different components.	-	-	-	-
PC3. Engineer solutions capable of bridging the gap between diverse operating systems within the automotive ecosystem.	-	-	-	-
PC4. Improve data parsing algorithms to effectively interpret and utilize diagnostic information across interconnected systems.	-	-	-	-
Standardization of Diagnostic Protocols	**5**	**10**	**10**	**-**
PC5. Ensure consistent use of diagnostic procedures across all automotive systems	-	-	-	-
PC6. Simplify and optimize the steps involved in diagnosing automotive issues	-	-	-	-
PC7. Improve the compatibility and communication between various diagnostic tools and systems.	-	-	-	-
PC8. Provide comprehensive training to technicians to effectively utilize standardized diagnostic procedures.	-	-	-	-
PC9. Align diagnostic protocols with established automotive industry standards and regulations.	-	-	-	-
Adherence to AUTOSAR Architecture	**5**	**10**	**10**	**-**
PC10. Study and comprehend the key principles and components of AUTOSAR architecture to ensure seamless integration	-	-	-	-
PC11. Enforce strict adherence to AUTOSAR standards throughout the integration process to maintain system integrity and reliability	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. Regularly assess the integration of AUTOSAR principles with automotive open system architecture to identify and address any discrepancies or inefficiencies	-	-	-	-
NOS Total	**20**	**40**	**40**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1309
NOS Name	Fundamental of Automotive Open System Architecture
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Automotive Service & Repair
NSQF Level	4.5
Credits	1.5
Version	1.0
Next Review Date	NA

ASC/N9843: Environmental Studies

Description

This NOS is about to Interpret Environmental Studies in conducting field studies, including data collection, observation, sampling, and recording relevant environmental data.

Scope

The scope covers the following :

- Develop a plan for collecting environmental data.
- Analyze the collected data using appropriate statistical or analytical techniques.
- Interpret the analyzed data in the context of environmental.

Elements and Performance Criteria

Develop a plan for collecting environmental data

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

PC1. Determine the types of environmental data required to address the study objectives.

PC2. Choose appropriate study sites based on the objectives of the study and the environmental factors being investigated.

PC3. develop a sampling strategy that ensures representative and reliable data collection.

PC4. Determine the necessary resources required for the data collection, including personnel, equipment, funding, and logistical support

Analyze the collected data using appropriate statistical or analytical techniques

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

PC5. Clean and preprocess the collected data to ensure its quality and suitability for analysis.

PC6. Explore the structure and characteristics of the data through descriptive statistics, visualizations, or summary tables.

PC7. Perform the chosen analytical techniques on the preprocessed data, following the appropriate methodology and procedures.

PC8. Validate and verify the results of the analysis by cross-checking them with other data sources, performing sensitivity analyses, or using alternative analytical techniques.

Interpret the analyzed data in the context of environmental.

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

PC9. Examine the analyzed data to identify patterns, trends, or relationships that may provide insights into the environmental system being studied.

PC10. Assess the importance and relevance of the study's findings in the context of the broader environmental field

PC11. Compare the study's findings with existing environmental knowledge, theories, or models to determine whether the results support, challenge, or extend current understanding.

PC12. Continuously review and refine the interpretation of the analyzed data as new information becomes available or as the environmental field evolves.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. fundamentals of the Fabrication Process

KU2. various types of machining processes such as drilling, boring, turning etc.

KU3. SOP recommended by the manufacturer for using tools, jigs, fixtures, measuring instruments etc., during the machining processes.

KU4. how to select and modify the CNC machining program

KU5. Environmental Science Knowledge: A strong foundation in environmental science, including ecology, geology, atmospheric science, and hydrology, is crucial for understanding the complexities of the natural environment.

KU6. Research Methods: Familiarity with various research methodologies, including quantitative and qualitative approaches, is vital for designing and executing field studies.

KU7. Data Collection Techniques: Proficiency in using different tools and techniques for data collection, such as field instruments, remote sensing, and GIS technology, is essential for accurate and reliable data acquisition.

KU8. Observation Skills: The ability to observe and document changes in the environment, both natural and human-induced, is crucial for understanding the dynamics of ecosystems and their responses to external factors.

KU9. Sampling Techniques: Knowledge of appropriate sampling methods, such as random, stratified, or systematic sampling, helps ensure that the data collected is representative and statistically valid.

KU10. Data Analysis: Understanding statistical analysis techniques, such as regression analysis, hypothesis testing, and data visualization, is necessary for interpreting and drawing meaningful conclusions from the collected data.

Generic Skills (GS)

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

GS1. read and interpret work instructions, machine drawings, reports and process documents

GS2. communicate the machining requirements to the seniors and other departments

GS3. communicate issues to the supervisor that occur during machining process

GS4. attentively listen and comprehend the information given by the master technician/team members

GS5. write reports related to production process in English/regional language

GS6. recognise a workplace problem and take suitable action

GS7. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS8. plan and organise work according to the work requirements

GS9. report to the supervisor or deal with a colleague individually, depending on the type of concern

GS10. complete the assigned tasks with minimum supervision

GS11. suggest improvements (if any) in current ways of working

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Develop a plan for collecting environmental data	**5**	**10**	**10**	**-**
PC1. Determine the types of environmental data required to address the study objectives.	1	2	2	-
PC2. Choose appropriate study sites based on the objectives of the study and the environmental factors being investigated.	2	3	3	-
PC3. develop a sampling strategy that ensures representative and reliable data collection.	1	3	3	-
PC4. Determine the necessary resources required for the data collection, including personnel, equipment, funding, and logistical support	1	2	2	-
Analyze the collected data using appropriate statistical or analytical techniques	**5**	**10**	**10**	**-**
PC5. Clean and preprocess the collected data to ensure its quality and suitability for analysis.	1	3	3	-
PC6. Explore the structure and characteristics of the data through descriptive statistics, visualizations, or summary tables.	1	2	2	-
PC7. Perform the chosen analytical techniques on the preprocessed data, following the appropriate methodology and procedures.	1	3	3	-
PC8. Validate and verify the results of the analysis by cross-checking them with other data sources, performing sensitivity analyses, or using alternative analytical techniques.	2	2	2	-
Interpret the analyzed data in the context of environmental.	**5**	**10**	**10**	**-**
PC9. Examine the analyzed data to identify patterns, trends, or relationships that may provide insights into the environmental system being studied.	1	2	2	-
PC10. Assess the importance and relevance of the study's findings in the context of the broader environmental field	1	2	2	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. Compare the study's findings with existing environmental knowledge, theories, or models to determine whether the results support, challenge, or extend current understanding.	1	3	3	-
PC12. Continuously review and refine the interpretation of the analyzed data as new information becomes available or as the environmental field evolves.	2	3	3	-
NOS Total	**15**	**30**	**30**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9843
NOS Name	Environmental Studies
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Generic
NSQF Level	4.5
Credits	3
Version	1.0
Last Reviewed Date	30/11/2023
Next Review Date	30/11/2026
NSQC Clearance Date	30/11/2023

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	-	-	-	-
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	-	-	-	-
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**	**-**	**-**
PC33. identify different types of Entrepreneurship and Enterprises	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
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**	**-**	**-**

National Occupational Standards (NOS) 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
Version	1.0
Last Reviewed Date	30/11/2023
Next Review Date	30/11/2026
NSQC Clearance Date	30/11/2023

ASC/N1310: Workshop Technology HCV (OJT)

Description

On the Job Training (OJT)

Scope

The scope covers the following :

- On the Job Training (OJT)

Elements and Performance Criteria

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

PC1. On the Job Training (OJT)

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. On the Job Training (OJT)

Generic Skills (GS)

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

GS1. On the Job Training (OJT)

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	-	**-**	**50**	**50**
PC1. On the Job Training (OJT)	-	-	50	50
NOS Total	**-**	**-**	**50**	**50**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1310
NOS Name	Workshop Technology HCV (OJT)
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Automotive Service & Repair
NSQF Level	4.5
Credits	11
Version	1.0
Next Review Date	NA

ASC/N1311: Electric Four-Wheeler Technology (BEV and Hybrid)

Description

This unit describes innovative approaches to automobile symptom-based diagnosis before carrying out service and repair an automobile.

Scope

The scope covers the following :

- Perform Motor and Powertrain Diagnostics.
- Analyse compatibility of charging infrastructure accurately.
- Diagnosing battery pack issues and its management

Elements and Performance Criteria

Perform Motor and Powertrain Diagnostics

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

PC1. Develop cutting-edge diagnostic protocols for electric four-wheeler motor and Powertrain systems

PC2. Design innovative diagnostic tools tailored specifically for electric vehicle motor and Powertrain diagnostics

PC3. Streamline diagnostic processes to enhance efficiency and accuracy in troubleshooting electric vehicle motor and Powertrain malfunctions

Analyse compatibility of charging infrastructure accurately

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

PC4. Evaluate the existing charging infrastructure to identify gaps and areas for improvement

PC5. Assess the compatibility of charging stations with the evolving needs of electric vehicles

PC6. Utilize data-driven analysis to accurately gauge the effectiveness of charging solutions

PC7. Lead initiatives to optimize charging infrastructure

Diagnosing battery pack issues and its management

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

PC8. Utilize diagnostic tools to pinpoint battery pack abnormalities swiftly

PC9. Assess voltage fluctuations and charging patterns to determine root causes accurately.

PC10. Implement timely repairs or replacements to restore battery pack functionality promptly.

PC11. Provide comprehensive guidance to vehicle owners on battery pack maintenance and usage practices.

PC12. Fine-tune charging systems and recalibrate settings for optimal performance.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Analyze the intricate architecture of electric vehicles to develop tailored diagnostic approaches

KU2. Utilize in-depth knowledge of battery systems to diagnose charging, capacity, and performance issues.

KU3. Distinguish between various electric drive systems and diagnose motor, inverter, and transmission-related malfunctions.

KU4. Navigate complex EV control units to troubleshoot communication errors and software glitches.

KU5. Master the use of specialized EV diagnostic tools such as battery analyzers and CAN bus readers.

KU6. Understand charging infrastructure protocols to diagnose charging station compatibility and performance issues.

KU7. Adhere to stringent safety protocols when diagnosing high-voltage EV systems to mitigate electrical hazards.

KU8. Implement remote diagnostic capabilities to analyze vehicle data remotely and provide real-time troubleshooting.

KU9. Stay updated on the latest advancements in electric vehicle technology through continuous learning and professional development.

KU10. Collaborate with EV manufacturers to access technical resources and contribute to the development of diagnostic solutions for emerging EV models.

Generic Skills (GS)

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

GS1. read and interpret workplace related documentation

GS2. interpret the needs of customers by understanding the key issues

GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. identify potential workplace problem and take suitable action

GS6. write in English/regional language

GS7. read various sources of information available for assessing service and repair requirements.

GS8. Read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates.

GS9. Communicate effectively at the workplace.

GS10. Plan work according to the required schedule and location

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform Motor and Powertrain Diagnostics	**5**	**10**	**10**	**-**
PC1. Develop cutting-edge diagnostic protocols for electric four-wheeler motor and Powertrain systems	-	-	-	-
PC2. Design innovative diagnostic tools tailored specifically for electric vehicle motor and Powertrain diagnostics	-	-	-	-
PC3. Streamline diagnostic processes to enhance efficiency and accuracy in troubleshooting electric vehicle motor and Powertrain malfunctions	-	-	-	-
Analyse compatibility of charging infrastructure accurately	**5**	**10**	**10**	**-**
PC4. Evaluate the existing charging infrastructure to identify gaps and areas for improvement	-	-	-	-
PC5. Assess the compatibility of charging stations with the evolving needs of electric vehicles	-	-	-	-
PC6. Utilize data-driven analysis to accurately gauge the effectiveness of charging solutions	-	-	-	-
PC7. Lead initiatives to optimize charging infrastructure	-	-	-	-
Diagnosing battery pack issues and its management	**5**	**10**	**10**	**-**
PC8. Utilize diagnostic tools to pinpoint battery pack abnormalities swiftly	-	-	-	-
PC9. Assess voltage fluctuations and charging patterns to determine root causes accurately.	-	-	-	-
PC10. Implement timely repairs or replacements to restore battery pack functionality promptly.	-	-	-	-
PC11. Provide comprehensive guidance to vehicle owners on battery pack maintenance and usage practices.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. Fine-tune charging systems and recalibrate settings for optimal performance.	-	-	-	-
NOS Total	**15**	**30**	**30**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1311
NOS Name	Electric Four-Wheeler Technology (BEV and Hybrid)
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Automotive Service & Repair
NSQF Level	4.5
Credits	3
Version	1.0
Next Review Date	NA

ASC/N1312: Heavy Electric Vehicle Technology (BUS and Trucks)

Description

This unit describes how we can execute comprehensive battery diagnostics to assess performance and health in heavy electric vehicles.

Scope

The scope covers the following :

- Conducting Battery Load Tests
- Analyzing Battery Management System Data.
- Performing Electrochemical Diagnostics.

Elements and Performance Criteria

Conducting Battery Load Tests

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

PC1. Ensure that the heavy electric vehicle is safely positioned and secured for testing

PC2. Arrange and make sure all necessary testing equipment, including load testers and multimeters, is calibrated and ready for use.

PC3. Connect the testing equipment to the electric vehicle's battery system by following manufacturer guidelines and safety procedures.

PC4. Initiate the battery load test and allow the load tester to apply a controlled load to the battery while monitoring voltage, current, and other relevant parameters

PC5. Observe the battery's response to the load, noting any irregularities or deviations from expected performance.

Analyzing Battery Management System Data

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

PC6. Proficiently interpreting battery management system (BMS) data to understand the performance metrics and health indicators of the battery pack in heavy electric vehicles

PC7. Identify anomalies or irregularities in the BMS data that could indicate potential issues with the battery pack.

PC8. Conduct trend analysis over time to track the degradation and performance trends of the battery pack.

PC9. Provide diagnostic recommendations to address any identified issues or concerns regarding the battery pack's performance and health. This may involve recommending specific maintenance procedures, such as cell balancing, temperature management, or recalibration, as well as suggesting potential repairs or replacements if necessary.

Performing Electrochemical Diagnostics

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

PC10. Lead the team in conducting thorough assessments of the battery's electrochemical properties, including voltage, current, temperature, and state of charge

PC11. Develop and implement diagnostic strategies to identify specific issues affecting the electrochemical performance of the battery pack

PC12. Provide recommendations for maintenance, repair, or replacement of battery components as needed based on the findings of the electrochemical diagnostics

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Perform detailed voltage and current measurements to evaluate battery performance
KU2. Conduct capacity tests to assess the energy storage capabilities of the battery pack.
KU3. Utilize specialized diagnostic tools to analyze battery cell balance and health.
KU4. Implement thermal imaging techniques to identify any overheating or thermal irregularities in the battery system.
KU5. Execute resistance tests on battery connections to ensure optimal electrical conductivity.
KU6. Analyze charging and discharging profiles to identify any abnormalities or inefficiencies.
KU7. Inspect battery management system (BMS) data for any error codes or warnings.
KU8. Conduct deep cycling tests to evaluate the battery's long-term stability and durability.
KU9. Perform impedance spectroscopy to assess internal resistance and impedance characteristics.
KU10. Generate comprehensive diagnostic reports outlining battery health, performance metrics, and recommended actions for maintenance or replacement.

Generic Skills (GS)

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

GS1. read and interpret workplace related documentation
GS2. interpret the needs of customers by understanding the key issues
GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade
GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
GS5. identify potential workplace problem and take suitable action
GS6. write in English/regional language
GS7. read various sources of information available for assessing service and repair requirements
GS8. Read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates.
GS9. Communicate effectively at the workplace.
GS10. Plan work according to the required schedule and location

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Conducting Battery Load Tests	**5**	**10**	**10**	**-**
PC1. Ensure that the heavy electric vehicle is safely positioned and secured for testing	-	-	-	-
PC2. Arrange and make sure all necessary testing equipment, including load testers and multimeters, is calibrated and ready for use.	-	-	-	-
PC3. Connect the testing equipment to the electric vehicle's battery system by following manufacturer guidelines and safety procedures.	-	-	-	-
PC4. Initiate the battery load test and allow the load tester to apply a controlled load to the battery while monitoring voltage, current, and other relevant parameters	-	-	-	-
PC5. Observe the battery's response to the load, noting any irregularities or deviations from expected performance.	-	-	-	-
Analyzing Battery Management System Data	**5**	**10**	**10**	**-**
PC6. Proficiently interpreting battery management system (BMS) data to understand the performance metrics and health indicators of the battery pack in heavy electric vehicles	-	-	-	-
PC7. Identify anomalies or irregularities in the BMS data that could indicate potential issues with the battery pack.	-	-	-	-
PC8. Conduct trend analysis over time to track the degradation and performance trends of the battery pack.	-	-	-	-
PC9. Provide diagnostic recommendations to address any identified issues or concerns regarding the battery pack's performance and health. This may involve recommending specific maintenance procedures, such as cell balancing, temperature management, or recalibration, as well as suggesting potential repairs or replacements if necessary.	-	-	-	-
Performing Electrochemical Diagnostics	**5**	**10**	**10**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. Lead the team in conducting thorough assessments of the battery's electrochemical properties, including voltage, current, temperature, and state of charge	-	-	-	-
PC11. Develop and implement diagnostic strategies to identify specific issues affecting the electrochemical performance of the battery pack	-	-	-	-
PC12. Provide recommendations for maintenance, repair, or replacement of battery components as needed based on the findings of the electrochemical diagnostics	-	-	-	-
NOS Total	**15**	**30**	**30**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1312
NOS Name	Heavy Electric Vehicle Technology (BUS and Trucks)
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Automotive Service & Repair
NSQF Level	4.5
Credits	3
Version	1.0
Next Review Date	NA

ASC/N1313: Value Added Services

Description

This unit describes innovative approaches to automobile symptom-based diagnosis before carrying out service and repair an automobile.

Scope

The scope covers the following :

- Developing Customized Service Packages.
- Implementing Innovative Diagnostic Solutions.
- Forging Strategic Partnerships.

Elements and Performance Criteria

Developing Customized Service Packages

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

PC1. Analyze client needs to tailor service packages that optimize vehicle performance

PC2. Customize diagnostic procedures to address specific concerns and maximize efficiency

PC3. Continuously refine service offerings based on feedback and industry advancements

PC4. Proactively identify potential issues and recommend preventative maintenance measures.

PC5. Provide comprehensive reports and recommendations to empower clients to make informed decisions.

Implementing Innovative Diagnostic Solutions.

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

PC6. Spearhead the integration of innovative software solutions, enabling real-time data analysis for rapid identification of automotive issues.

PC7. Champion the adoption of advanced diagnostic methodologies, ensuring timely and precise detection of vehicle malfunctions, thereby minimizing downtime for customers.

PC8. Mentor and train technicians on the utilization of new diagnostic equipment and procedures, empowering the team to deliver exceptional service experiences.

Forging Strategic Partnerships.

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

PC9. Identify potential industry collaborators and initiate dialogue for partnership opportunities.

PC10. Develop a comprehensive plan outlining mutual benefits and goals for strategic alliances.

PC11. Execute proactive outreach campaigns to establish rapport and cultivate lasting relationships. D)Leverage innovative approaches to integrate value-added services into existing diagnostic frameworks.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Analyze customer needs and vehicle data to tailor diagnostic services

KU2. Develop innovative diagnostic strategies to address complex automotive issues
KU3. Implement cutting-edge diagnostic tools and technologies for enhanced accuracy
KU4. Lead a team of technicians in delivering high-quality diagnostic services
KU5. Collaborate with engineers and manufacturers to refine diagnostic procedures
KU6. Provide training and mentorship to technicians on advanced diagnostic techniques
KU7. Document diagnostic findings and solutions to build a knowledge base
KU8. Continuously evaluate and improve diagnostic processes for efficiency
KU9. Communicate effectively with customers to explain diagnostic results and recommendations
KU10. Anticipate future automotive trends and adjust services accordingly.

Generic Skills (GS)

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

GS1. read and interpret workplace related documentation
GS2. interpret the needs of customers by understanding the key issues
GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade
GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
GS5. identify potential workplace problem and take suitable action
GS6. write in English/regional language
GS7. read various sources of information available for assessing service and repair requirements
GS8. Read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates
GS9. Communicate effectively at the workplace
GS10. Plan work according to the required schedule and location

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Developing Customized Service Packages	**5**	**10**	**10**	**-**
PC1. Analyze client needs to tailor service packages that optimize vehicle performance	-	-	-	-
PC2. Customize diagnostic procedures to address specific concerns and maximize efficiency	-	-	-	-
PC3. Continuously refine service offerings based on feedback and industry advancements	-	-	-	-
PC4. Proactively identify potential issues and recommend preventative maintenance measures.	-	-	-	-
PC5. Provide comprehensive reports and recommendations to empower clients to make informed decisions.	-	-	-	-
Implementing Innovative Diagnostic Solutions.	**5**	**10**	**10**	**-**
PC6. Spearhead the integration of innovative software solutions, enabling real-time data analysis for rapid identification of automotive issues.	-	-	-	-
PC7. Champion the adoption of advanced diagnostic methodologies, ensuring timely and precise detection of vehicle malfunctions, thereby minimizing downtime for customers.	-	-	-	-
PC8. Mentor and train technicians on the utilization of new diagnostic equipment and procedures, empowering the team to deliver exceptional service experiences.	-	-	-	-
Forging Strategic Partnerships.	**5**	**10**	**10**	**-**
PC9. Identify potential industry collaborators and initiate dialogue for partnership opportunities.	-	-	-	-
PC10. Develop a comprehensive plan outlining mutual benefits and goals for strategic alliances.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. Execute proactive outreach campaigns to establish rapport and cultivate lasting relationships. D)Leverage innovative approaches to integrate value-added services into existing diagnostic frameworks.	-	-	-	-
NOS Total	**15**	**30**	**30**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1313
NOS Name	Value Added Services
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Automotive Service & Repair
NSQF Level	4.5
Credits	3
Version	1.0
Next Review Date	NA

ASC/N1314: Specialized Vehicles

Description

This unit describes to Analyze and Evaluate specialized vehicles with technology advancements

Scope

The scope covers the following :

- Perform in-depth technical assessments on specialized vehicles
- Test and assess the performance of Specialized vehicles under various conditions
- Develop detailed reports on the technical aspects of the Specialized vehicles.

Elements and Performance Criteria

Perform in-depth technical assessments on specialized vehicles

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

PC1. Conduct Visual Inspection and Preliminary Assessment of Specialized Vehicle

PC2. Monitor the status of critical systems like the engine, transmission, battery management system (BMS), and other ECUs for any faults or malfunctions.

PC3. Assess passive and active safety features like airbags, seatbelt systems, crumple zones, and automatic collision detection..

PC4. Conduct on-road driving tests to assess real-world performance, handling, and comfort under various conditions (e.g., urban, highway, rough terrain).

Test and assess the performance of Specialized vehicles under various conditions

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

PC5. Install and calibrate any necessary test equipment, such as data loggers, telemetry systems, dynamometers, and GPS tracking devices for real-time data collection.

PC6. Set up diagnostic tools for monitoring critical vehicle systems during the test (e.g., battery management, powertrain efficiency, ADAS performance).

PC7. Define the specific test scenarios based on vehicle type and use case.

PC8. Conduct tests to assess the vehicle’s handling characteristics, including steering response, cornering ability, and balance, especially under high-speed and evasive maneuver conditions

Develop detailed reports on the technical aspects of the Specialized vehicles

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

PC9. Determine the purpose of the report (e.g., post-service evaluation, pre-purchase inspection, diagnostic analysis, warranty compliance, fleet performance, etc.)

PC10. Document performance results, including any trouble codes, sensor data, powertrain performance (e.g., acceleration, braking), and energy consumption (for EVs).

PC11. Verify the vehicle’s compliance with regulatory standards and safety protocols (e.g., crash test ratings, emissions, environmental standards).

PC12. Document any discrepancies with regulatory or manufacturer standards, including emissions testing for ICE or hybrid vehicles.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Vehicle Systems: In-depth understanding of the various systems in specialized vehicles, including powertrain, chassis, electrical, and electronic systems.

KU2. Advanced Diagnostics Tools: Familiarity with advanced diagnostic tools (e.g., OBD-II scanners, oscilloscopes, multi-meters) and software used for fault detection and analysis.

KU3. Engineering Principles: Knowledge of automotive engineering principles, including thermodynamics, fluid dynamics, and mechanics, specifically as they pertain to vehicle performance and efficiency.

KU4. Electric and Hybrid Vehicles: Understanding the intricacies of electric and hybrid vehicle systems, including battery management, regenerative braking, and electric drive.

KU5. Autonomous Systems: Knowledge of the technologies involved in advanced driver-assistance systems (ADAS) and fully autonomous vehicles, including sensors (radar, LiDAR, cameras) and software algorithms.

KU6. Connectivity and Telematics: Familiarity with connected vehicle technologies, data communication protocols, and telematics systems that monitor vehicle performance in real-time.

KU7. Troubleshooting Techniques: Proficient in troubleshooting methodologies, including systematic analysis, testing, and validation of vehicle systems and components.

KU8. Data Interpretation: Ability to interpret diagnostic trouble codes (DTCs), sensor data, and performance metrics to identify and resolve issues accurately.

KU9. Problem Solving: Strong problem-solving skills to devise effective solutions for complex technical issues while minimizing downtime and cost.

KU10. Critical Thinking: Ability to evaluate the implications of technology advancements on vehicle performance and maintenance requirements.

KU11. Regulatory Compliance: Knowledge of automotive regulations and standards, particularly those pertaining to emissions, safety, and data privacy in connected vehicles.

KU12. Safety Protocols: Understanding of safety protocols related to working with high-voltage systems in electric vehicles and other specialized technologies.

KU13. Safety Protocols: Understanding of safety protocols related to working with high-voltage systems in electric vehicles and other specialized technologies.

KU14. Familiarity with relevant regulations and safety standards (e.g., EPA, OSHA).

Generic Skills (GS)

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

GS1. read and interpret workplace related documentation

GS2. interpret the needs of customers by understanding the key issues

GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. identify potential workplace problem and take suitable action

GS6. write in English/regional language

GS7. read various sources of information available for assessing service and repair requirements

GS8. Read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates.

GS9. Communicate effectively at the workplace.

GS10. Plan work according to the required schedule and location

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform in-depth technical assessments on specialized vehicles	**5**	**10**	**10**	**-**
PC1. Conduct Visual Inspection and Preliminary Assessment of Specialized Vehicle	-	-	-	-
PC2. Monitor the status of critical systems like the engine, transmission, battery management system (BMS), and other ECUs for any faults or malfunctions.	-	-	-	-
PC3. Assess passive and active safety features like airbags, seatbelt systems, crumple zones, and automatic collision detection..	-	-	-	-
PC4. Conduct on-road driving tests to assess real-world performance, handling, and comfort under various conditions (e.g., urban, highway, rough terrain).	-	-	-	-
Test and assess the performance of Specialized vehicles under various conditions	**5**	**10**	**10**	**-**
PC5. Install and calibrate any necessary test equipment, such as data loggers, telemetry systems, dynamometers, and GPS tracking devices for real-time data collection.	-	-	-	-
PC6. Set up diagnostic tools for monitoring critical vehicle systems during the test (e.g., battery management, powertrain efficiency, ADAS performance).	-	-	-	-
PC7. Define the specific test scenarios based on vehicle type and use case.	-	-	-	-
PC8. Conduct tests to assess the vehicle’s handling characteristics, including steering response, cornering ability, and balance, especially under high-speed and evasive maneuver conditions	-	-	-	-
Develop detailed reports on the technical aspects of the Specialized vehicles	**5**	**10**	**10**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC9. Determine the purpose of the report (e.g., post-service evaluation, pre-purchase inspection, diagnostic analysis, warranty compliance, fleet performance, etc.)	-	-	-	-
PC10. Document performance results, including any trouble codes, sensor data, powertrain performance (e.g., acceleration, braking), and energy consumption (for EVs).	-	-	-	-
PC11. Verify the vehicle's compliance with regulatory standards and safety protocols (e.g., crash test ratings, emissions, environmental standards).	-	-	-	-
PC12. Document any discrepancies with regulatory or manufacturer standards, including emissions testing for ICE or hybrid vehicles.	-	-	-	-
NOS Total	**15**	**30**	**30**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1314
NOS Name	Specialized Vehicles
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Automotive Service & Repair
NSQF Level	4.5
Credits	3
Version	1.0
Next Review Date	NA

ASC/N1315: Artificial Intelligence in Automotive Service

Description

This unit describes innovative approaches to automobile symptom-based diagnosis before carrying out service and repair an automobile.

Scope

The scope covers the following :

- Implementing advanced artificial intelligence algorithms tailored for automotive diagnostics.
- Integrating AI-driven decision support systems into diagnostic processes.
- Leveraging AI-powered predictive maintenance solutions.

Elements and Performance Criteria

Implementing advanced artificial intelligence algorithms tailored for automotive diagnostics

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

PC1. Identify cutting-edge AI algorithms suitable for automotive diagnostics, considering factors like accuracy, efficiency, and real-time capabilities.

PC2. Tailor chosen algorithms to specific diagnostic needs, ensuring seamless integration with existing diagnostic systems and protocols.

PC3. Rigorously evaluate algorithm performance using real-world automotive data, refining as necessary to achieve optimal diagnostic accuracy and reliability.

Integrating AI-driven decision support systems into diagnostic processes

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

PC4. Implement AI-driven diagnostic tools to streamline troubleshooting procedures, enhancing efficiency and accuracy in identifying automotive issues

PC5. Integrate machine learning algorithms to analyze complex vehicle data, empowering technicians to make informed decisions swiftly and confidently during diagnostics.

PC6. Utilize predictive analytics to forecast potential maintenance needs, enabling proactive measures to prevent costly breakdowns and optimize vehicle performance.

Leveraging AI-powered predictive maintenance solutions

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

PC7. Incorporate AI-driven diagnostic tools to streamline troubleshooting processes and reduce downtime.

PC8. Deploy AI-enabled sensors to monitor critical vehicle systems and preemptively identify anomalies

PC9. Optimize maintenance schedules by leveraging predictive algorithms to minimize costs and maximize efficiency.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Analyze environmental studies data to identify potential correlations between vehicle performance and environmental factors

KU2. Utilize insights from environmental research to develop diagnostic strategies that consider the impact of climate and geography on vehicle systems.

KU3. Lead training sessions for technicians, imparting knowledge on advanced diagnostic techniques and methodologies.

KU4. Incorporate knowledge of air quality regulations into diagnostic processes to ensure compliance and minimize environmental impact.

KU5. Adapt diagnostic procedures based on seasonal variations and environmental conditions to enhance accuracy and reliability.

KU6. Collaborate with environmental scientists and researchers to leverage their expertise in understanding the intersection between vehicle technology and environmental factors.

KU7. Implement sustainable diagnostic practices that prioritize energy efficiency, waste reduction, and resource conservation in the workshop.

KU8. Stay informed about advancements in eco-friendly vehicle technologies and incorporate them into diagnostic approaches.

KU9. Educate technicians on the environmental implications of vehicle maintenance and repair practices, fostering a culture of environmental responsibility.

KU10. Document and share best practices for eco-conscious diagnostic methods to contribute to the automotive industry's efforts towards environmental sustainability.

Generic Skills (GS)

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

GS1. read and interpret workplace related documentation

GS2. interpret the needs of customers by understanding the key issues

GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. identify potential workplace problem and take suitable action

GS6. write in English/regional language

GS7. read various sources of information available for assessing service and repair requirements

GS8. Read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates

GS9. Communicate effectively at the workplace

GS10. Plan work according to the required schedule and location

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Implementing advanced artificial intelligence algorithms tailored for automotive diagnostics	**5**	**10**	**10**	**-**
PC1. Identify cutting-edge AI algorithms suitable for automotive diagnostics, considering factors like accuracy, efficiency, and real-time capabilities.	-	-	-	-
PC2. Tailor chosen algorithms to specific diagnostic needs, ensuring seamless integration with existing diagnostic systems and protocols.	-	-	-	-
PC3. Rigorously evaluate algorithm performance using real-world automotive data, refining as necessary to achieve optimal diagnostic accuracy and reliability.	-	-	-	-
Integrating AI-driven decision support systems into diagnostic processes	**5**	**10**	**10**	**-**
PC4. Implement AI-driven diagnostic tools to streamline troubleshooting procedures, enhancing efficiency and accuracy in identifying automotive issues	-	-	-	-
PC5. Integrate machine learning algorithms to analyze complex vehicle data, empowering technicians to make informed decisions swiftly and confidently during diagnostics.	-	-	-	-
PC6. Utilize predictive analytics to forecast potential maintenance needs, enabling proactive measures to prevent costly breakdowns and optimize vehicle performance.	-	-	-	-
Leveraging AI-powered predictive maintenance solutions	**5**	**10**	**10**	**-**
PC7. Incorporate AI-driven diagnostic tools to streamline troubleshooting processes and reduce downtime.	-	-	-	-
PC8. Deploy AI-enabled sensors to monitor critical vehicle systems and preemptively identify anomalies	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC9. Optimize maintenance schedules by leveraging predictive algorithms to minimize costs and maximize efficiency.	-	-	-	-
NOS Total	**15**	**30**	**30**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1315
NOS Name	Artificial Intelligence in Automotive Service
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Automotive Service & Repair
NSQF Level	4.5
Credits	3
Version	1.0
Next Review Date	NA

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Components of Assessment: - Each subject will be assessed in three components: Theory (20% weightage), Practical (40% weightage), and On-job Training (OJT, 40% weightage).

2. Passing Parameters: - To pass the semester, students must meet both the assessment parameters given below.

Parameter 1 - Weighted Semester Score: - Students must achieve a minimum of 60% in the weighted average score across all three components (Theory, Practical, and OJT) for each subject.

Parameter 2 - Individual Component Score: - Students need to score at least 40% in each individual component (Theory, Practical, and OJT) of every subject.

Mandatory Note: This qualification can be offered as part of a Diploma program, in line with the 39th NSQC, ASDC Diploma (Diploma in Manufacturing Technology) approval. However, achieving 40 credits in a year is mandatory for progression within the Diploma course. Therefore, it is required to select at least one optional NOS in every semester to meet this requirement.

Minimum Aggregate Passing % at QP Level : 40

(**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/N1304.Automobile Symptom Based Diagnosis	20	40	40	0	100	10
ASC/N1305.Automobile Electrical fault finding	20	40	40	-	100	10
ASC/N1306.Various Features of Vehicle Scanner	20	40	40	-	100	10
ASC/N9841.Best Industrial Practices	15	30	30	-	75	10
ASC/N1307.Noise Vibration Harshness Diagnosis	20	40	40	-	100	10
ASC/N1308.DTC based diagnosis	20	40	40	-	100	10
ASC/N1309.Fundamental of Automotive Open System Architecture	20	40	40	-	100	10
ASC/N9843.Environmental Studies	15	30	30	-	75	10
DGT/VSQ/N0104.Employability Skills (120 Hours)	20	30	-	-	50	10
ASC/N1310.Workshop Technology HCV (OJT)	-	-	50	50	100	10
Total	**170**	**330**	**350**	**50**	**900**	**100**

Optional: 1 Semester 5: Electric Four-Wheeler Technology (BEV and Hybrid)

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N1311.Electric Four-Wheeler Technology (BEV and Hybrid)	15	30	30	-	75	50
Total	**15**	**30**	**30**	**-**	**75**	**50**

Optional: 2 Semester 5: Heavy Electric Vehicle Technology (BUS and Trucks)

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N1312.Heavy Electric Vehicle Technology (BUS and Trucks)	15	30	30	-	75	50
Total	**15**	**30**	**30**	**-**	**75**	**50**

Optional: 3 Semester 6: Value Added Services

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N1313.Value Added Services	15	30	30	-	75	50
Total	**15**	**30**	**30**	**-**	**75**	**50**

Optional: 4 Semester 6: Specialized Vehicles

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N1314.Specialized Vehicles	15	30	30	-	75	50
Total	**15**	**30**	**30**	**-**	**75**	**50**

Optional: 5 Semester 6: Artificial Intelligence in Automotive Service

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N1315.Artificial Intelligence in Automotive Service	15	30	30	-	75	50
Total	**15**	**30**	**30**	**-**	**75**	**50**

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.