



Model Curriculum

QP Name: Digital Twin engineer

QP Code: CSC/Q0411

Version: 1.0

NSQF Level: 5.5

Model Curriculum Version: 1.0

Capital Goods and Strategic Skill Council

39,1st Floor, Samyak Tower, Pusa Rd, Block 9A, WEA, Karol Bagh, New Delhi, Delhi, 110005

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Training Parameters

Sector	Capital Goods
Sub-Sector	Machine Tools, Dies, Moulds and Press Tools, Plastics Manufacturing Machinery, Textile Manufacturing Machinery, Process Plant Machinery, Electrical and Power Machinery, Light Engineering Goods, Defence Equipment, FireFighting & Safety Equipment
Occupation	Design
Country	India
NSQF Level	5.5
Aligned to NCO/ISCO/ISIC Code	
Minimum Educational Qualification and Experience	UG Degree in relevant field + 2 years of relevant experience or 3 Years UG Degree in Science and Technology (B.Sc. / BCA) / 4 years BE, B.Tech (Electrical, Electronics, Mechanical, Mechatronics, Instrumentation and Control)* or 10th grade pass +3 years Diploma in relevant field + 5 year of relevant experience or Previous NSQC level 5 + 1.5 years of relevant experience *Subject to being offered as 6 months internship/ project
Pre-Requisite License or Training	NA
Minimum Job Entry Age	24 Years
Last Reviewed On	31 st January 2024
Next Review Date	31 st January 2027
NSQC Approval Date	31 st January 2024
QP Version	1.0
Model Curriculum Creation Date	31 st January 2024
Model Curriculum Valid Up to Date	30 January 2027
Model Curriculum Version	1.0
Minimum Duration of the Course	570 Hours
Maximum Duration of the Course	570 Hours

Program Overview

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

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills to:

- Describe methodologies for creating accurate and detailed digital twin models.
- Demonstrate skills to fulfill the process of integrating digital twin models with physical systems and assets.
- Implement mechanisms for updating twin models based on live data feeds.
- Implement mechanisms for updating twin models based on live data feeds.
- Design scalable and modular software solutions for creating and managing digital twins.

Compulsory Modules

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

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
CSC/N0517: Develop, and Implement digital twin solution based on the behavior of physical object. NOS Version- 1.0 NSQF Level- 5.5	50:00	100:00	60:00	00:00	210:00
Module 1: Introduction to the role of a Digital Twin Engineer	05:00	00:00	0:00	00:00	05:00
Module 2: Carry out Digital Twin Development and integration of Twin models	45:00	100:00	60:00	00:00	205:00
CSC/N0518: Manage Data, Software, and Technical Support. NOS Version-1.0 NSQF Level- 5.5	60:00	90:00	30:00	00:00	180:00
Module 3: Perform Software Development	60:00	90:00	30:00	00:00	180:00
CSC/N1339 Collaboratively coordinate with the team NOS Version- 1.0 NSQF Level- 5.5	40:00	50:00	0:00	00:00	90:00

Module 4: Collaboratively coordinate with the team	40:00	50:00	0:00	00:00	90:00
CSC/N0505 Health, Safety and Environment at workplace NOS Version- 1.0 NSQF Level- 5	10:00	20:00	00:00	00:00	30:00
Module 5: Health, Safety and Environment at workplace	10:00	20:00	00:00	00:00	30:00
DGT/VSQ/N0102 - Employability Skills (60 hours) NOS Version No. – 1.0 NSQF Level – 4	20:00	40:00	00:00	00:00	60:00
Module 6: Introduction to Employability Skills	20:00	40:00	00:00	00:00	60:00
Total Duration	180:00	300:00	90:00	00:00	570:00

Module Details

Module 1: Introduction to the role of a Digital Twin engineer

Bridge module, Mapped to CSC/N0517 v1.0

Terminal Outcomes:

- Discuss the job role of a Digital Twin Engineer

Duration: 05:00	Duration: 0:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the size and scope of the capital good industry and its sub-sectors. • Discuss the role and responsibilities of a Digital Twin Engineer. • Identify various employment opportunities for a Digital Twin Engineer. 	
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
NA	

Module 2: Develop, and implement digital twin solution based on the behavior of physical object

Bridge module, Mapped to CSC/N0517 v1.0

Terminal Outcomes:

- Define and comprehend the fundamental principles and concepts of digital twins in industrial applications.
- Demonstrate Digital Twin Modeling Techniques.
- Demonstrate the process of integrating digital twin models with physical systems and assets.

Duration: 45:00	Duration: 100:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the theoretical foundations of digital twins, including their definition, purpose, and the symbiotic relationship between physical assets and their virtual counterparts. • Discuss theoretical aspects of modeling techniques, focusing on creating accurate and comprehensive digital twin representations for diverse physical assets and systems. • Elaborate the theoretical underpinnings of real-time data integration, ensuring that digital twin models accurately reflect the current state of physical assets by incorporating live sensor data. • Explain the theoretical aspects of integrating digital twin models with IoT devices, understanding how this integration captures real-world dynamics and enhances the fidelity of the digital twin. • Discuss the importance of collaboration with CG IIoT Data Analytics Engineers, gaining insights into leveraging data analytics for continuous improvement of digital twin models. • Explain theoretical concepts related to conducting simulations and analyses using digital twin models to assess performance, predict behavior, and identify optimization opportunities in various scenarios. 	<ul style="list-style-type: none"> • Design, develop, and implement practical digital twin models for diverse physical assets and systems, demonstrating proficiency in modeling techniques. • Demonstrate steps to implement practical solutions for real-time data integration, ensuring the accuracy and reliability of digital twin representations through the incorporation of live sensor data. • Showcase practical skills in integrating digital twin models with IoT devices, capturing real-world dynamics and enhancing the fidelity of the digital twin. • Demonstrate effective collaboration with CG IIoT Data Analytics Engineers, showcasing the ability to leverage data insights for continuous improvement of digital twin models. • Conduct practical simulations and analyses using digital twin models to assess performance, predict behavior, and identify optimization opportunities in diverse scenarios. • Demonstrate steps to implement practical algorithms and models for scenario analysis and predictive maintenance within the digital twin environment, showcasing proficiency in algorithm development. • Show how to work practically with CG engineers and domain experts to understand system requirements and

<ul style="list-style-type: none"> • Describe the theoretical foundations of developing and implementing algorithms for scenario analysis and predictive maintenance within the digital twin environment. • Explain the theoretical aspects of working closely with CG engineers and domain experts, understanding system requirements, and ensuring accurate representation in the digital twin. • Discuss the importance of collaborating for the integration of digital twin technology into existing and new engineering projects, understanding the role of digital twins in enhancing project outcomes. 	<p>ensure accurate representation in the digital twin.</p> <ul style="list-style-type: none"> • Demonstrate skills to collaborate practically on the integration of digital twin technology into existing and new engineering projects, contributing to improved project outcomes through the application of digital twin principles. • Demonstrate steps to address challenges related to computational efficiency and resource utilization.
Classroom Aids	
<p>Computer, Projection Equipment, PowerPoint Presentation and Software, Facilitator’s Guide, Participant’s Handbook.</p>	
Tools, Equipment and Other Requirements	
<p>Software such as Siemens NX, Dassault Systèmes CATIA, or PTC Creo for creating 3D digital twin models, Simulation Software: Tools like Ansys, Simulink, or COMSOL for simulating the behavior of the digital twin, Visualization Tools: Applications like Unity3D or Unreal Engine for creating realistic visualizations of digital twins, Programming Languages: Proficiency in languages like Python, C++, Java, or other languages relevant to the digital twin development framework, Version Control Systems, Database Management Systems, Software such as Siemens NX, Dassault Systèmes CATIA, or PTC Creo for creating 3D digital twin models, Simulation Software: Tools like Ansys, Simulink, or COMSOL for simulating the behavior of the digital twin.</p> <p>Visualization Tools: Applications like Unity3D or Unreal Engine for creating realistic visualizations of digital twins</p> <p>Programming Languages: Proficiency in languages like Python, C++, Java, or other languages relevant to the digital twin development framework.</p> <p>Version Control Systems, Database Management Systems</p>	

Module 3: Manage Data, Software, and Technical Support

Bridge module, Mapped to CSC/N0518 v1.0

Terminal Outcomes:

- Demonstrate the ability to select the appropriate programming language based on project requirements.
- Design modular and scalable software solutions to accommodate the complexities of digital twin systems.
- Implement databases and data structures suitable for handling large volumes of complex data associated with digital twins.
- Create intuitive and informative visualization tools for monitoring and interacting with digital twin simulations.
- Conduct comprehensive testing to ensure the reliability, accuracy, and robustness of digital twin software.

Duration: 60:00	Duration: 90:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the principles and practices of software application development. • Acquire knowledge of programming languages and frameworks relevant to digital twin creation. • Stay informed about the latest technologies and trends in digital twin development and related industries. • Evaluate emerging tools and methodologies to enhance digital twin capabilities. • Grasp the fundamentals of UI/UX design principles. • Design intuitive and user-friendly interfaces for effective interaction with digital twin models. • Learn strategies to ensure accessibility and usability of digital twin interfaces for diverse stakeholders. • Tailor user interfaces to meet the needs of both technical and non-technical users. 	<ul style="list-style-type: none"> • Show how to develop and implement comprehensive testing plans for digital twin models. • Execute tests to validate the accuracy, reliability, and functionality of digital twin applications. • Utilize version control systems (e.g., Git) to manage and track changes in digital twin software. • Utilize debugging tools and techniques to troubleshoot complex software problems. • Practice and demonstrate skills to identify and address discrepancies or issues identified during testing phases. • Practice how to implement corrective measures and ensure the seamless functioning of digital twin models. • Follow coding standards and best practices in digital twin software development. • Create comprehensive documentation for digital twin software, including code documentation, user guides, and system architecture documentation. • Develop clear and concise guides for both technical and non-technical stakeholders. • Develop effective communication skills to convey findings and updates to stakeholders. • Generate detailed reports on digital twin performance, issues, and improvements.
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	

Tools, Equipment and Other Requirements

Software such as Siemens NX, Dassault Systèmes CATIA, or PTC Creo for creating 3D digital twin models, Simulation Software: Tools like Ansys, Simulink, or COMSOL for simulating the behavior of the digital twin, Visualization Tools: Applications like Unity3D or Unreal Engine for creating realistic visualizations of digital twins, Programming Languages: Proficiency in languages like Python, C++, Java, or other languages relevant to the digital twin development framework, Version Control Systems, Database Management Systems, Software such as Siemens NX, Dassault Systèmes CATIA, or PTC Creo for creating 3D digital twin models, Simulation Software: Tools like Ansys, Simulink, or COMSOL for simulating the behavior of the digital twin.

Visualization Tools: Applications like Unity3D or Unreal Engine for creating realistic visualizations of digital twins

Programming Languages: Proficiency in languages like Python, C++, Java, or other languages relevant to the digital twin development framework.

Version Control Systems, Database Management Systems

Module 4: Collaboratively coordinate with the team

Bridge module, Mapped to CSC/N1339 v1.0

Terminal Outcomes:

- Create a collaborative and inclusive team environment conducive to effective communication and cooperation.
- Work cooperatively with team members, fostering a positive and productive atmosphere that contributes to achieving team goals.

Duration: 40:00	Duration: 50:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Define and explain the key concepts of team dynamics, including roles, norms, and communication patterns. • Discuss the importance of applying effective communication strategies within a team, considering various communication channels and styles. • Describe the components necessary for creating a positive and productive team environment in the context of a Data Analytics Engineer role. • Describe the importance of collaboration in the field of data analytics. • Define the role of each team member in the decision-making process. • Define and demonstrate a sense of responsibility in the context of a Data Analytics Engineer. 	<ul style="list-style-type: none"> • Conduct a practical team-building exercise to foster collaboration and teamwork. • Demonstrate the experience and identify strategies for building a cohesive team environment. • Participate in a communication simulation, considering various scenarios encountered in a data analytics team. • Receive feedback on communication effectiveness and adapt communication styles accordingly. • Work on a collaborative data analytics project, addressing real-world challenges. • Demonstrate the ability to effectively collaborate with team members to achieve project objectives. • Simulate decision-making scenarios specific to data analytics projects. • Contribute actively to decision-making processes and analyze the impact of decisions on project outcomes. • Take on specific responsibilities within the team, such as project management or task ownership. • Demonstrate a proactive approach to fulfilling responsibilities and meeting project deadlines. • Attend a diversity training workshop to gain insights into respecting diverse opinions, customs, and preferences. • Apply the knowledge gained to enhance collaboration within the team, considering cultural and professional diversity.
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	

Load Cells, Strain Gauges, Transducers, Mechanical Governors, Pressure Gauges, Micrometers, Jigs and Fixtures, Templates and Patterns, Insulation Testers, Vernier Calliper, Dead Weight Tester, Manometers, Gyroscope, Screw Driver, Testers etc.

Module 5: Maintain Health, Safety and Environment at workplace

Bridge module, Mapped to CSC/N0505 v1.0

Terminal Outcomes:

- Demonstrate ways to maintain personal health and safety.
- Describe the process of assisting in hazard management.
- Explain how to check the first aid box, firefighting and safety equipment.
- Describe the process of assisting in waste management.
- Explain the importance of following the fire safety guidelines.
- Explain the importance of following the emergency and first-aid procedures.
- Demonstrate the process of carrying out relevant documentation and review

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the recommended practices to be followed to ensure protection from infections and transmission to others, such as the use of hand sanitizer and face mask. • Explain the importance and process of checking the work conditions, assessing the potential health and safety risks, and take appropriate measures to mitigate them. • Explain the importance and process of selecting and using the appropriate PPE relevant to the task and work conditions. • Explain the recommended techniques to be followed while lifting and moving heavy objects to avoid injury. • Explain the importance of following the manufacturer's instructions and workplace safety guidelines while working on heavy machinery, tools and equipment. • Explain the importance and process of identifying existing and potential hazards at work. • Describe the process of assessing the potential risks and injuries associated with the various hazards. • Explain how to prevent or minimise different types of hazards. • Explain how to handle and store hazardous materials safely. 	<ul style="list-style-type: none"> • Demonstrate the use of appropriate Personal Protective Equipment (PPE) relevant to the task and work conditions. • Demonstrate how to handle hazardous materials safely. • Demonstrate the process of testing the firefighting and various safety equipment to ensure they are in usable condition. • Demonstrate the process of recycling and disposing different types of waste appropriately. • Demonstrate how to use the appropriate type of fire extinguisher to extinguish different types of fires safely. • Demonstrate how to administer appropriate first aid to the injured personnel. • Demonstrate the process of performing Cardiopulmonary Resuscitation (CPR) on a potential victim of cardiac arrest. • Demonstrate the process of carrying out appropriate documentation following a health and safety incident at work, including all the required information.

- Explain the importance of ensuring the first aid box is updated with the relevant first aid supplies.
- Describe the process of checking and testing the firefighting and various safety equipment to ensure they are in a usable condition.
- Explain the criteria for segregating waste into appropriate categories.
- Describe the appropriate methods for recycling the recyclable waste.
- Describe the process of disposing of the non-recyclable waste safely and the applicable regulations.
- Explain the use of different types of fire extinguishers to extinguish different types of fires.
- State the recommended practices to be followed for a safe rescue during a fire emergency.
- Explain how to request assistance from the fire department to extinguish a serious fire.
- Explain the appropriate practices to be followed during workplace emergencies to ensure safety and minimise loss to organisational property.
- State the common health and safety hazards present in a work environment, associated risks, and how to mitigate them.
- State the safe working practices to be followed while working at various hazardous sites and using electrical equipment.
- Explain the importance of ensuring easy access to firefighting and safety equipment.
Explain the appropriate preventative and remedial actions to be taken in the case of exposure to toxic materials, such as poisonous chemicals and gases.
- Explain various causes of fire in different work environments and the recommended precautions to be taken to prevent fire accidents.

- Describe different methods of extinguishing fire.
- List different materials used for extinguishing fire.
- Explain the applicable rescue techniques to be followed during a fire emergency.
- Explain the importance of placing safety signs and instructions at strategic locations in a workplace and following them.
- Explain different types of first aid treatment to be provided for different types of injuries.
- State the potential injuries associated with incorrect manual handling.
- Explain how to move an injured person safely.
- State various hazards associated with the use of various machinery, tools, implements, equipment and materials.
- Explain the importance of ensuring no obstruction and free access to fire exits.
- Explain how to free a person from electrocution safely.
- Explain how to administer appropriate first aid to an injured person.
- Explain how to perform Cardiopulmonary Resuscitation (CPR).
- Explain the importance of coordinating with the emergency services to request urgent medical assistance for persons requiring professional medical attention or hospitalisation.
 State the appropriate documentation to be carried out following a health and safety incident at work, and the relevant information to be included.
- Explain the importance and process of reviewing the health and safety conditions at work regularly or following an incident.

<ul style="list-style-type: none">• Explain the importance and process of implementing appropriate changes to improve the health and safety conditions at work.	
Classroom Aids	
Computer, Projection Equipment, PowerPoint Presentation and Software, Facilitator’s Guide, Participant’s Handbook.	
Tools, Equipment and Other Requirements	
Personal Protective Equipment, Cleaning Equipment and Materials, Sanitizer, Soap, Mask	

Module 6: Employability Skills

Bridge module, Mapped to DGT/VSQ/N0102 -Employability Skills (60 hours) v1.0

Terminal Outcomes:

- Discuss the Employability Skills required for jobs in various industries
- Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
- Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan

Duration: 20:00	Duration: 40:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the Employability Skills required for jobs in various industries • List different learning and employability related GOI and private portals and their usage • Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen • Discuss importance of relevant 21st century skills. • Describe the benefits of continuous learning. • Explain the importance of active listening for effective communication • Discuss the significance of working collaboratively with others in a team • Discuss the significance of escalating sexual harassment issues as per POSH act. • List the common components of salary and compute income, expenditure, taxes, investments etc. • Discuss the legal rights, laws, and aids • Describe the role of digital technology in today's life • Discuss the significance of displaying responsible online behaviour while browsing, using various social media 	<ul style="list-style-type: none"> • Practice different environmentally sustainable practices. • Exhibit 21st century skills like Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life. • Demonstrate to use basic English sentences for everyday conversation in different contexts, in person and over the telephone • Read and interpret text written in basic English • Write a short note/paragraph / letter/e -mail using basic English • Create a career development plan with well-defined short- and long-term goals • Communicate effectively using verbal and nonverbal communication etiquette. • Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD • Outline the importance of selecting the right financial institution, product, and service • Demonstrate how to carry out offline and online financial transactions, safely and securely

<p>platforms, e-mails, etc., safely and securely</p> <ul style="list-style-type: none"> • Explain the types of entrepreneurship and enterprises • Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan • Describe the 4Ps of Marketing- Product, Price, Place and Promotion and apply them as per requirement • Detail the significance of analyzing different types and needs of customers • Explain the significance of identifying customer needs and responding to them in a professional manner. • Discuss the significance of maintaining hygiene and dressing appropriately • Explain the significance of maintaining hygiene and confidence during an interview • List the steps for searching and registering for apprenticeship opportunities 	<ul style="list-style-type: none"> • Operate digital devices and use the associated applications and features, safely and securely • Create sample word documents, excel sheets and presentations using basic features • Utilize virtual collaboration tools to work effectively • Devise a sample business plan, for the selected business opportunity • Create a professional Curriculum Vitae (CV) • Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively • Perform a mock interview
Classroom Aids:	
PPT, Laptop, White Board, Marker, Projector & Screen, Audio-visual, Chart paper, telephone connection, landline phone, and other required stationery.	
Tools, Equipment and Other Requirements	
Computer (PC) with latest configurations – and Internet connection with standard operating system and standard word processor and worksheet software (Licensed) (all software should either be latest version or one/two version below), Scanner cum Printer	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
PhD	(Mechanical/ Electrical/ Mechatronics)	2		1		Practical skills and knowledge required in the relevant field
PG (Mechanical/ Electrical/ Mechatronics)	(Mechanical/ Electrical/ Mechatronics)	3		2		Practical skills and knowledge required in the relevant field
UG Degree (Mechanical/ Electrical/ Mechatronics)	(Mechanical/ Electrical/ Mechatronics)	4		3		Practical skills and knowledge required in the relevant field

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role: “ Digital Twin Engineer ” mapped to QP: “CSC/Q0411, v1.0”. Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: “Trainer(VET and skills)”, mapped to the Qualification Pack: “MEP/Q2601 V3.0”. Minimum accepted as per respective SSC guidelines is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
PHD	(Mechanical/ Electrical/ Mechatronics)	3		2		Practical skills and knowledge required in the relevant field
Post graduate	(Mechanical/ Electrical/ Mechatronics)	4		3		Practical skills and knowledge required in the relevant field
Graduate	(Mechanical/ Electrical/ Mechatronics)	5		4		Practical skills and knowledge required in the relevant field

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: “Digital Twin Engineer” mapped to QP: “CSC/Q0411, v1.0”. Minimum accepted score is 80%	Recommended that the assessor is Certified for the Job Role: “Assessor(VET and skills)”, mapped to the Qualification Pack: “MEP/Q2701, v3.0”, with a minimum score of 80%.

Assessment Strategy

1. Assessment System Overview:

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

2. Testing Environment

To ensure a conducive environment for conducting a test, the trainer will:

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

3. Assessment Quality Assurance levels / Framework:

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

4. Types of evidence or evidence-gathering protocol:

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

5. Method of verification or validation:

To verify the details submitted by the training centre, the assessor will undertake:

- A surprise visit to the assessment location
- A random audit of the batch
- A random audit of any candidate

6. Method for assessment documentation, archiving, and access

To protect the assessment papers and information, the assessor will ensure:

- Hard copies of the documents are stored

- Soft copies of the documents & photographs of the assessment are uploaded/accessed from Cloud Storage
- Soft copies of the documents & photographs of the assessment are stored on the Hard drive

References

Glossary

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

Acronyms and Abbreviations

Term	Description
NOS	National Skills Qualification Committee
NSQF	National Skills Qualification Framework
OJT	On-the-Job Training
OMR	Optical Mark Recognition
PC	Performance Criteria
PwD	Persons with Disabilities
QP	Qualification Pack
SDMS	Skill Development & Management System
SIP	Skill India Portal
SSC	Sector Skill Council
TC	Trainer Certificate
ToA	Training of Assessors
ToT	Training of Trainers
TP	Training Provider