







# **Model Curriculum**

**QP Name: Machine Learning (ML) Engineer** 

QP Code: TEL/Q6603

Version: 2.0

NSQF Level: 5

**Model Curriculum Version: 1.0** 

Telecom Sector Skill Council || 3rd Floor, Plot No 126, Sector – 44 Gurgaon - 122003

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# **Training Parameters**

Sector	Telecom
Sub-Sector	Network Managed Services
Occupation	Data Handling - Network Managed Services
Country	India
NSQF Level	5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7422.6603
Minimum Educational Qualification and Experience	Completed 2nd year of 3-year/ 4-years UG OR Pursuing 2nd year of 3-year/ 4-years UG and continuing education OR Completed 2nd year of diploma (after 12th) OR Pursuing 2nd year of 2-year diploma after 12th with No Experience required OR 12th pass with 2 years of any combination of NTC/NAC/CITS or equivalent with No Experience required OR Completed 3-year diploma after 10th OR 12th Grade pass with 1-year of NTC/NAC OR Completed 1st year of 3-year/ 4-years UG with 1-year relevant experience OR 12th Grade pass with 2-year relevant experience OR 12th Grade pass with 4-year relevant experience Previous relevant Qualification of NSQF Level 4 with 3-year relevant experience
Pre-Requisite License or Training	ΝΑ
Minimum Job Entry Age	21 Years
Last Reviewed On	30/06/2022
Next Review Date	30/06/2025
NSQC Approval Date	30/06/2022
QP Version	2.0

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Model Curriculum Creation Date	30/06/2022
Model Curriculum Valid Up to Date	30/06/2025
Model Curriculum Version	1.0
Minimum Duration of the Course	630 Hours
Maximum Duration of the Course	630 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 the process of preparing to develop machine learning systems.
- Demonstrate the process of developing and assisting in the implementation of machine learning systems.
- Explain the importance of implementing effective communication and coordination at work.
- Explain the importance of managing work and resources, and ensuring health and safety at work.

### **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
Bridge Module	20:00	10:00	00:00	-	30:00
Module 1: Introduction to the role of a Machine Learning Engineer	20:00	10:00	00:00	-	30:00
TEL/N6605: Prepare to Develop Machine Learning (ML) Systems NOS Version-1.0 NSQF Level- 5	70:00	110:00	60:00	-	240:00
Module 2: Process of preparing to develop machine learning systems	70:00	110:00	60:00	-	240:00
TEL/N6606: Develop and Assist in the Implementation of Machine Learning (ML) Systems NOS Version-1.0 NSQF Level- 5	70:00	110:00	60:00	-	240:00
Module 3: Process of developing and assisting in the implementation of machine learning systems	70:00	110:00	60:00	-	240:00





TEL/N9103: Implement effective interaction at workplace NOS Version-1.0 NSQF Level-5	10:00	20:00	00:00	-	30:00
Module 4: Communication and Interpersonal skills	10:00	20:00	00:00	-	30:00
TEL/N9104: Manage work, Resource and safety at workplace NOS Version-1.0 NSQF Level-5	10:00	20:00	00:00	-	30:00
Module 5: Working effectively and optimizing resources for a safe	10:00	20:00	00:00	-	30:00
DGT/VSQ/N0102 Employability Skills (60 Hours)	60:00	00:00	00:00	00:00	60:00
Total Duration	240:00	270:00	120:00	00:00	630:00





# **Module Details**

## Module 1: Introduction to the role of a Machine Learning Engineer

### Bridge Module

### **Terminal Outcomes:**

- Discuss the job role of a Machine Learning Engineer.
- Explain the scope of work for a Machine Learning Engineer.

Duration: 10:00
Practical – Key Learning Outcomes
<ul> <li>Role play based on case studies, outlining the scope, responsibilities, and challenges of a Machine Learning Engineer.</li> <li>Analyse the requirements for the course and prepare for the pre-requisites of the course.</li> </ul>

### Tools, Equipment and Other Requirements

NA





# Module 2: Prepare to Develop Machine Learning (ML) Systems Mapped to TEL/N6605 v1.0

### **Terminal Outcomes:**

- Explain the importance of determining the scope of work.
- Demonstrate the process of planning the development of machine learning systems.

Duration: 70:00	Duration: 110:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul> <li>Describe the process of determining the business objectives, project outcomes, and the scope of resolution required.</li> <li>Explain the importance and process of evaluating the existing Machine Learning (ML) processes.</li> <li>Explain the criteria for selecting appropriate datasets and data representation methods.</li> <li>Explain how to analyse large and complex datasets to extract insights and select the appropriate technique to be used.</li> <li>Explain how to create the data validation strategies.</li> <li>Describe the process of determining the pre-processing or feature engineering to be carried out on a given dataset.</li> <li>Explain how to determine the data augmentation pipelines.</li> <li>Describe the process of developing models to achieve the business objectives, along with the relevant metrics to track the progress.</li> </ul>	<ul> <li>Demonstrate the process of evaluating the existing Machine Learning (ML) processes.</li> <li>Demonstrate how to analyse large and complex datasets to extract insights and select the appropriate technique to be used.</li> </ul>
Classroom Aids	
Training Kit (Trainer Guide, Presentations). White	board, Marker, Projector
Tools, Equipment and Other Requirements	
Laptop/ Desktop with pre-installed (Java, C++) lan	nguages / Software.





## Module 3: Develop and Assist in the Implementation of Machine Learning (ML) Systems Mapped to TEL/N6606 v1.0

### **Terminal Outcomes:**

- Demonstrate the process of collecting, cleaning and preparing data.
- Describe the process of developing relevant algorithms.
- Demonstrate the process of performing data analysis.
- Demonstrate the process of performing machine learning tests.
- Describe the process of training and retraining models.
- Describe the process of assisting in the implementation of machine learning systems.

Duration: 70:00	Duration: 110:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul> <li>Explain how machine learning engineering integrates data science and software engineering.</li> </ul>	<ul> <li>Demonstrate how to create algorithms based on statistical modelling procedures.</li> </ul>
• Explain how self-running software functions to use data and automate predictive models.	<ul> <li>Demonstrate the process of performing the relevant computations and using the relevant algorithms for programming.</li> </ul>
<ul> <li>Explain how data structures, algorithms, computability and complexity and computer architecture are applied in machine learning engineering.</li> </ul>	<ul> <li>Show how to use data modelling and evaluation strategy to find patterns and predict unseen instances.</li> </ul>
<ul> <li>Explain the application of computer science, computational linguistics, data science, mathematics, statistics, and algorithms in machine learning.</li> </ul>	<ul> <li>Demonstrate the process of carrying out machine learning tests, interpreting the test results and making appropriate adjustments based on test results.</li> </ul>
<ul> <li>Explain the benefits and process of using Python, Java, R code writing software, etc.</li> </ul>	<ul> <li>Show how to evaluate and transform data science prototypes.</li> </ul>
<ul> <li>Explain the ML frameworks, libraries, data structures, data modelling, and software architecture.</li> </ul>	<ul> <li>Demonstrate the process of performing statistical analysis to resolve data set problems.</li> </ul>
<ul> <li>Explain the end-to-end application of machine learning algorithms.</li> </ul>	<ul> <li>Show how to solve complex problems with multi-layered data sets.</li> </ul>
<ul> <li>Describe the software engineering and software design processes.</li> </ul>	<ul> <li>Show how to implement appropriate ML algorithms and libraries.</li> <li>Demonstrate how to apply to apply the ML</li> </ul>
• Describe the process of explaining complex processes in simple terms.	<ul> <li>Demonstrate how to analyse the ML algorithms that could be used to solve a given problem and rank them</li> </ul>
<ul> <li>Describe the process of designing and developing machine learning and deep learning systems.</li> </ul>	<ul><li>by their success probability.</li><li>Show how to develop ML algorithms to analyse huge volumes of historical</li></ul>





- Explain the importance of performing data cleaning to ensure the quality of data.
- Explain how to identify differences in data distribution that could affect performance when deploying the model in the real world.
- Explain how to research and implement appropriate ML algorithms and libraries.
- Describe the process of analysing the ML algorithms that could be used to solve a given problem and rank them by their success probability.
- Explain how to optimise existing machine learning libraries and frameworks.
- Explain the importance of ensuring the algorithms generate accurate user recommendations.
- Explain how to train models and optimise their hyper-parameters.
- Explain the importance of carrying out research and implementing best practices to improve the existing machine learning infrastructure.
- Describe the process of retraining the existing systems based on new machine learning models.
- Explain the importance of following the latest machine learning developments and technologies.
- State the infrastructure and data pipelines needed to bring code to production.
- Explain the importance of monitoring production to ensure production is carried out based on the developed machine earning system(s).

#### Classroom Aids

Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop

### Tools, Equipment and Other Requirements

Laptop / Desktop with pre-installed (Python, R Code writing Software, Google Cloud Auto Machine Learning, Azure Machine Learning studio) languages / Software.

data to make predictions.

- Demonstrate the process of designing machine learning systems/ applications and self-running artificial intelligence (AI) software to automate predictive models.
- Show how to create useful information from unstructured data by auto-tagging images and text-tospeech conversions.
- Show how to analyse the errors of the model and develop appropriate strategies to rectify them.
- Demonstrate how to document the machine learning processes as per the organisational policy.
- Demonstrate the process of setting up and maintaining scalable machine learning solutions in production.





# Module 4: Communication and Interpersonal skills Mapped to TEL/N9103, v1.0

### **Terminal Outcomes:**

- Communicate effectively and develop interpersonal skills
- Develop sensitivity towards differently abled people.

Duration: 10:00	Duration: 20:00	
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes	
<ul> <li>Identify roles and responsibilities and understand organisation's policies.</li> <li>List organisational guidelines for dress code, time schedules, language and other soft skill aspects.</li> <li>List the different methods of communication.</li> <li>Explain the importance of effective communication and interpersonal skills.</li> <li>Analyse the common reasons for interpersonal conflicts and ways of managing them effectively.</li> <li>Identify types of information needed by colleagues and its importance.</li> <li>Identify the need for implementing standards, guidelines and practices pertaining to gender sensitivity, including work ethics and workplace etiquettes.</li> <li>Explain the work ethics, workplace etiquettes as well as standards and guidelines for all genders and PwD.</li> <li>List health and safety requirements for persons with disability.</li> <li>List the rights, duties and benefits available at workplace for person with disability.</li> <li>Identify the process of recruiting people with disability for a specific job.</li> <li>Analyse the specific ways to help persons with disability overcome the challenges.</li> </ul>	<ul> <li>Demonstrate how to interact with superiors in terms of escalating problems, reporting work completion and receiving feedback.</li> <li>Apply team building skills to assist colleagues in maximizing effectiveness and efficiency of carrying out tasks.</li> <li>Demonstrate appropriate communication skills and etiquettes while interacting with others.</li> <li>Resolve conflicts with colleagues and adhere to commitment.</li> <li>Demonstrate ideal workplace ethics while interacting with colleagues with respect to sharing information, co-ordinating work and showing respect.</li> <li>Follow organisation's policy for working with team members.</li> <li>Illustrate importance of team goals over individual goals.</li> <li>Use inclusive language irrespective of the gender/ disability of the person.</li> <li>Demonstrate appropriate behaviour towards all genders and differently abled people.</li> </ul>	

### **Classroom Aids:**

White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector

#### **Tools, Equipment and Other Requirements**

Sample of escalation matrix, organisation structure.





# Module 5: Working effectively and optimizing resources for a safe workplace

### Mapped to NOS TEL/N9104 v1.0

### **Terminal Outcomes:**

• Plan work effectively, implement safety practices and optimize use of resources

Duration: 10:00	Duration: 20:00	
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes	
<ul> <li>List the importance of following the standard operating procedures of the company w.r.t. privacy, confidentiality and security.</li> <li>List the key performance indicators for the new tasks.</li> <li>Identify the opportunities for team building workshops and motivational trainings.</li> <li>List and explain work requirements to be followed by the team.</li> <li>Identify the issues with and handle them.</li> <li>Discuss correct way to show emotions at workplace.</li> <li>Describe the importance of timely completion of tasks.</li> <li>Explain the importance of providing and receiving feedback constructively.</li> <li>Analyse ways to optimize usage of resources.</li> <li>List the importance, cause and effect of greening of jobs.</li> <li>Identify different types of hazards such as illness, accidents, fires etc.</li> <li>List the steps to report accident and health related issues as per SOP.</li> <li>Explain the concept of waste management.</li> <li>List the methods of waste disposal.</li> <li>Differentiate between recyclable and non-recyclable waste.</li> </ul>	<ul> <li>Demonstrate techniques to save on cost and time.</li> <li>Demonstrate routine cleaning of tools, equipment and machines to ensure team follows the same.</li> <li>Use resources such as water judiciously.</li> <li>Check for malfunctions in equipment and report as per SOP.</li> <li>Report any breaches in safety and security to the concerned person.</li> <li>Illustrate ways to keep work area clean such as mopping spills and leaks, cleaning grease stains etc.</li> <li>Check for spills and leaks and plug the same.</li> <li>Demonstrate segregation of types of hazardous waste.</li> <li>Illustrate proper waste disposal procedures and how to dispose-off hazardous waste.</li> <li>Illustrate ways to find exact cause of a problem and validate the same in case done by a team member.</li> </ul>	





• List electronic waste disposal procedures.

### **Classroom Aids:**

White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector

**Tools, Equipment and Other Requirements** 

Personal Protection Equipment: safety glasses, head protection, rubber gloves, safety footwear, warning signs and tapes, fire extinguisher and first aid kit





### Module 6: On-the-Job Training Mapped to Machine Learning Engineer (TEL/Q6603 v1.0)

Mai	ndatory Duration: 120:00	Recommended Duration: 00:00			
Loca	Location: On-Site				
Teri	ninal Outcomes				
1.	Explain the process of evaluating the existing	Machine Learning (ML) processes.			
2.	Explain the criteria for selecting appropriate of	datasets and data representation methods.			
3.	Create algorithms based on statistical modell	ing procedures.			
4.	4. Use data modelling and evaluation strategy to find patterns and predict unseen instances.				
5.	5. Carry out machine learning tests, interpret the test results and make appropriate adjustments based on test results.				
6.	Perform statistical analysis to resolve data se	t problems.			
7.	Develop ML algorithms to analyse huge volur	nes of historical data to make predictions.			
8.	. Set up and maintain scalable machine learning solutions in production.				
9.	9. Create schedules and rosters for the team to ensure they understand individual work requirements.				
10.	Carry out routine cleaning of tools, machines	and equipment.			





## Module 8: DGT/VSQ/N0102 Employability Skills (60 hours)

### Mapped to Machine Learning Engineer

Mandatory	Duration:	60:00

S.N o.	Module Name	Key Learning Outcomes	Duration (hours)
1.	Introduction to Employability Skills	<ul> <li>Discuss the Employability Skills required for jobs in various industries.</li> </ul>	1.5
		<ul> <li>List different learning and employability related GOI and private portals and their usage.</li> </ul>	
2.	Constitutional values - Citizenship	• 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.	1.5
		<ul> <li>Show how to practice different environmentally sustainable practices.</li> </ul>	
	Becoming a	• Discuss importance of relevant 21st century skills.	2.5
3.	Professional in the 21st Century	<ul> <li>Exhibit 21st century skills like Self-Awareness, Behavior 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.</li> </ul>	
		Describe the benefits of continuous learning.	
4.	Basic English Skills	<ul> <li>Show how to use basic English sentences for every day. conversation in different contexts, in person and over the telephone.</li> </ul>	10
		<ul> <li>Read and interpret text written in basic English</li> <li>Write a short note/paragraph / letter/e -mail using basic English.</li> </ul>	
5.	Career Development & Goal Setting	<ul> <li>Create a career development plan with well-defined short- and long-term goals.</li> </ul>	2
	Communication Skills	<ul> <li>Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.</li> </ul>	5
6.		<ul> <li>Explain the importance of active listening for effective communication.</li> </ul>	
		<ul> <li>Discuss the significance of working collaboratively with others in a team.</li> </ul>	
7.	Diversity & Inclusion	<ul> <li>Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD.</li> </ul>	2.5
		<ul> <li>Discuss the significance of escalating sexual harassment issues as per POSH act.</li> </ul>	
	Financial and Legal Literacy	<ul> <li>Outline the importance of selecting the right financial institution, product, and service.</li> </ul>	5
8.		<ul> <li>Demonstrate how to carry out offline and online financial transactions, safely and securely.</li> </ul>	
	Machine Learning (ML)	<ul> <li>List the common components of salary and compute</li> </ul>	





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		income, expenditure, taxes, investments etc.	
		<ul> <li>Discuss the legal rights, laws, and aids.</li> </ul>	
	Essential Digital	• Describe the role of digital technology in today's life.	10
	Skills	<ul> <li>Demonstrate how to operate digital devices and use the associated applications and features, safely and securely.</li> </ul>	
9.		<ul> <li>Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely.</li> </ul>	
		<ul> <li>Create sample word documents, excel sheets and presentations using basic features.</li> </ul>	
		Utilize virtual collaboration tools to work effectively.	
	Entrepreneurship	• Explain the types of entrepreneurship and enterprises.	7
10.		<ul> <li>Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan.</li> </ul>	
10.		<ul> <li>Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement.</li> </ul>	
		<ul> <li>Create a sample business plan, for the selected business opportunity.</li> </ul>	
	Customer Service	<ul> <li>Describe the significance of analyzing different types and needs of customers.</li> </ul>	5
11		<ul> <li>Explain the significance of identifying customer needs and responding to them in a professional manner.</li> </ul>	
		<ul> <li>Discuss the significance of maintaining hygiene and dressing appropriately.</li> </ul>	
	Getting Ready for	Create a professional Curriculum Vitae (CV).	
	Apprenticeship & Jobs	<ul> <li>Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively.</li> </ul>	
12		<ul> <li>Discuss the significance of maintaining hygiene and confidence during an interview.</li> </ul>	8
		Perform a mock interview.	
		<ul> <li>List the steps for searching and registering for apprenticeship opportunities.</li> </ul>	





	LIST OF TOOLS & EQUIPMENT FOR EMPLOYABILITY SKILLS						
S No.	Name of the Equipment	Quantity					
1.	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)	As required					
2.	UPS	As required					
3.	Scanner cum Printer	As required					
4.	Computer Tables	As required					
5.	Computer Chairs	As required					
6.	LCD Projector	As required					
7.	White Board 1200mm x 900mm	As required					
Note: Abo	ve Tools &Equipment not required, if Computer LAB is available in the institute	2.					





# Annexure

### Trainer Requirements (Machine Learning Engineer)

Trainer Prerequisites						
Minimum Educational	Specialization	Relevant Industry Experience		Training Experience		Remarks
Qualification		Years	Specialization	Years	Specialization	
B.E./B.Tech/ BCA/B.Sc.	Electronics/Telecom /IT and other relevant domains	1	Active Networks/IoT Domain	0	NA	Eligible for ToT program

Trainer Certification						
Domain Certification	Platform Certification					
Job Role " <b>Machine Learning (ML) Engineer</b> ", "TEL/Q6603, v2.0", Minimum accepted score is 80%	Job Role: <b>"Trainer (VET and Skills)</b> "", "MEP/Q2601 v2.0", Minimum Accepted score is 80%					





# Assessor Requirements (Machine Learning Engineer)

Assessor Prerequisites						
Minimum Educational	Specialization	Relevant Industry Experience		Training Experience		Remarks
Qualification		Years	Specialization	Years	Specialization	
B.E./B.Tech/ BCA/B.Sc.	Electronics/Telecom /IT and other relevant domains	1	Active Networks/IoT Domain	0	NA	Eligible for ToA program

Assessor Certification						
Domain Certification	Platform Certification					
Job Role " <b>Machine Learning (ML) Engineer</b> ", "TEL/Q6603, v2.0", Minimum accepted score is 80%	Job Role: " <b>Assessor (VET and Skills)</b> "", "MEP/Q2701 v2.0", Minimum Accepted score is 80%					





# **Trainer Requirements (Employability Skills 60 hours)**

Trainer Prerequisites							
Minimum Educational	Specialization	Relevant Industry Experience		Training Experience		Remarks	
Qualification		Years	Specialization	Years	Specialization		
Graduate/CITS	Any discipline			2	Teaching experience	Prospective ES trainer should:	
Current ITI trainers	Employability Skills Training (3 days full-time course done between 2019-2022)					<ul> <li>have good communication skills</li> <li>be well versed in English</li> <li>have digital skills</li> </ul>	
Certified current EEE trainers (155 hours)	from Management SSC (MEPSC)					<ul> <li>have digital skins</li> <li>have attention to det</li> <li>be adaptable</li> <li>have willingness to</li> </ul>	
Certified Trainer	Qualification Pack: Trainer (MEP/Q0102)					learn	

Trainer Certification						
Domain Certification	Platform Certification					
Certified in 60-hour Employability NOS (2022), with a minimum score of 80%	NA					
OR Certified in 120-, 90-hour Employability NOS (2022), with a minimum score of 80%						





# Master Trainer Requirements (Employability Skills 60 hours)

Master Trainer Prerequisites							
Minimum Educational	Specialization	Relevant Industry Experience		Trainir	ng Experience	Remarks	
Qualification		Years	Specialization	Years	Specialization		
Graduate/CITS	Any discipline			3	Employability Skills curriculum training experience with an interest to train as well as orient other peer trainers	<ul> <li>Prospective ES Master trainer should:</li> <li>have good communication skills</li> <li>be well versed in English</li> <li>have basic digital skil</li> </ul>	
Certified Master Trainer	Qualification Pack: Master Trainer (MEP/Q2602			3	EEE training of Management SSC (MEPSC) (155 hours)	<ul> <li>have attention to detail</li> <li>be adaptable</li> <li>have willingness to learn</li> <li>be able to grasp concepts fast and is creative with teaching practices and likes sharing back their learning with others</li> </ul>	

Master Trainer Certification						
Domain Certification	Platform Certification					
Certified in 60-hour Employability NOS (2022), with a minimum score of <b>90%.</b>	NA					
OR						
Certified in 120-, 90-hour Employability NOS (2022), with a minimum score of <b>90%</b>						





### 1. Assessment System Overview:

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

### 2. Testing Environment:

- Confirm that the centre is available at the same address as mentioned on SDMS or SIP.
- Check the duration of the training.
- Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
- If the batch size is more than 30, then there should be 2 Assessors.
- Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
- Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
- Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
- Check the availability of the Lab Equipment for the particular Job Role.
- 3. Assessment Quality Assurance levels / Framework:
  - Question papers created by the Subject Matter Experts (SME).
  - Question papers created by the SME verified by the other subject Matter Experts.
  - Questions are mapped with NOS and PC.
  - Question papers are prepared considering that level 1 to 3 are for the unskilled & semiskilled individuals, and level 4 and above are for the skilled, supervisor & higher management.
  - An assessor must be ToA certified & 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.
  - Center photographs with signboards and scheme-specific branding.
  - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period.
  - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos.
- 5. Method of verification or validation:
  - A surprise visit to the assessment location.
  - A random audit of the batch.
  - Random audit of any candidate.





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

### Assessment Strategy (Employability Skills 60 hours)

The trainee will be tested for the acquired skill, knowledge and attitude through formative/summative assessment at the end of the course and as this NOS and MC is adopted across sectors and qualifications, the respective AB can conduct the assessments as per their requirements.



# References



## Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	A key learning outcome is a 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).
(M) TLO	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on-site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on-site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	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 Occupational Standard (s)
NSQF	National Skills Qualifications Framework
TLO	On-the-job Training
QP	Qualifications Pack
PwD	People with Disability
PPE	Personal Protective Equipment
ES	Employability Skills