



Machine Learning (ML) Engineer

QP Code: TEL/Q6603

Version: 1.0

NSQF Level: 5

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

Qualification Pack

Contents

TEL/Q6603: Machine Learning (ML) Engineer	3
<i>Brief Job Description</i>	3
Applicable National Occupational Standards (NOS)	3
<i>Compulsory NOS</i>	3
<i>Qualification Pack (QP) Parameters</i>	3
TEL/N6605: Prepare to Develop Machine Learning (ML) Systems	5
TEL/N6606: Develop and Assist in the Implementation of Machine Learning (ML) Systems	9
TEL/N9103: Implement Effective Interaction at workplace	17
TEL/N9104: Manage Work, Resources and Safety at workplace	22
Assessment Guidelines and Weightage	27
<i>Assessment Guidelines</i>	27
<i>Assessment Weightage</i>	28
Acronyms	29
Glossary	30

Qualification Pack

TEL/Q6603: Machine Learning (ML) Engineer

Brief Job Description

A Machine Learning Engineer develops self-running AI software to automate predictive models for recommended searches, virtual assistants, translation apps, etc. The individual designs machine learning systems, generates accurate predictions by applying algorithms, and resolves data set problems.

Personal Attributes

The individual must have attention to detail along with strong analytical and problem-solving skills. The person should have excellent verbal and written communication skills. The individual must be able to work for long durations with concentration. Excellent time management skills, interpersonal skills, and the ability to work in coordination with others are the other important requirements in this job role.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [TEL/N6605: Prepare to Develop Machine Learning \(ML\) Systems](#)
2. [TEL/N6606: Develop and Assist in the Implementation of Machine Learning \(ML\) Systems](#)
3. [TEL/N9103: Implement Effective Interaction at workplace](#)
4. [TEL/N9104: Manage Work, Resources and Safety at workplace](#)

Qualification Pack (QP) 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

Qualification Pack

<p>Minimum Educational Qualification & Experience</p>	<p>Graduate (in relevant field) with 1 Year of experience in relevant field OR Diploma (after 12th Class of 3 years in Electronics/Telecom/IT and other relevant fields) with 1 Year of experience in relevant field OR B.E./B.Tech (Electronics/Telecom/IT and other relevant fields) OR 10th Class + I.T.I (2 years in Electronics/Telecom/IT and other relevant fields) with 4 Years of experience relevant experience OR 12th Class with 4 Years of experience relevant experience OR Certificate-NSQF (NSQF-L4 AI & ML - Jr. Telecom Data Analyst) with 4 Years of experience relevant experience</p>
<p>Minimum Level of Education for Training in School</p>	
<p>Pre-Requisite License or Training</p>	<p>NA</p>
<p>Minimum Job Entry Age</p>	<p>21 Years</p>
<p>Last Reviewed On</p>	<p>NA</p>
<p>Next Review Date</p>	<p>30/06/2025</p>
<p>NSQC Approval Date</p>	<p>30/06/2022</p>
<p>Version</p>	<p>1.0</p>
<p>Reference code on NQR</p>	<p>2022/TEL/TSSC/06071</p>
<p>NQR Version</p>	<p>1.0</p>

Qualification Pack

TEL/N6605: Prepare to Develop Machine Learning (ML) Systems

Description

This OS unit is about making the appropriate preparations for developing machine learning systems.

Scope

The scope covers the following :

- Determine the scope of work
- Plan the development of machine learning systems

Elements and Performance Criteria

Determine the scope of work

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

- PC1.** co-ordinate with stakeholders to analyse business problems
- PC2.** determine the business objectives, project outcomes, and the scope of resolution required
- PC3.** determine and refine machine learning objectives through consultation with the stakeholders
- PC4.** identify the issues that need to be resolved to make machine programs more effective

Plan the development of machine learning systems

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

- PC5.** evaluate the existing Machine Learning (ML) processes
- PC6.** select appropriate datasets and data representation methods
- PC7.** analyse large and complex datasets to extract insights and select the appropriate technique to be used
- PC8.** identify the need of retraining the existing machine programs based on agreed objectives
- PC9.** create the data validation strategies
- PC10.** determine the pre-processing or feature engineering to be carried out on a given dataset
- PC11.** determine the data augmentation pipelines
- PC12.** develop models to achieve the business objectives, along with the relevant metrics to track the progress

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** the process of determining the business objectives, project outcomes, and the scope of resolution required
- KU2.** the importance and process of evaluating the existing Machine Learning (ML) processes
- KU3.** the criteria for selecting appropriate datasets and data representation methods
- KU4.** the process of analysing large and complex datasets to extract insights and selecting the appropriate technique to be used

Qualification Pack

- KU5.** the process of creating data validation strategies
- KU6.** the process of determining the pre-processing or feature engineering to be carried out on a given dataset
- KU7.** the process of determining the data augmentation pipelines
- KU8.** the process of developing models to achieve the business objectives, along with the relevant metrics to track the progress

Generic Skills (GS)

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

- GS1.** maintain work related notes and records
- GS2.** read the relevant literature to get the latest updates about the field of work
- GS3.** listen attentively to understand the information/ instructions being shared
- GS4.** communicate politely and professionally
- GS5.** plan and priorities tasks to ensure timely completion
- GS6.** co-ordinate with the co-workers to achieve the work objectives
- GS7.** evaluate all possible solutions to a problem to select the best one
- GS8.** take quick decisions to deal with workplace emergencies/accidents

Qualification Pack
Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Determine the scope of work</i>	13	15	-	4
PC1. co-ordinate with stakeholders to analyse business problems	2	2	-	1
PC2. determine the business objectives, project outcomes, and the scope of resolution required	3	4	-	1
PC3. determine and refine machine learning objectives through consultation with the stakeholders	4	4	-	1
PC4. identify the issues that need to be resolved to make machine programs more effective	4	5	-	1
<i>Plan the development of machine learning systems</i>	22	35	-	11
PC5. evaluate the existing Machine Learning (ML) processes	2	3	-	1
PC6. select appropriate datasets and data representation methods	2	2	-	1
PC7. analyse large and complex datasets to extract insights and select the appropriate technique to be used	4	5	-	1
PC8. identify the need of retraining the existing machine programs based on agreed objectives	3	5	-	2
PC9. create the data validation strategies	2	4	-	1
PC10. determine the pre-processing or feature engineering to be carried out on a given dataset	2	5	-	2
PC11. determine the data augmentation pipelines	3	5	-	1
PC12. develop models to achieve the business objectives, along with the relevant metrics to track the progress	4	6	-	2
NOS Total	35	50	-	15

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N6605
NOS Name	Prepare to Develop Machine Learning (ML) Systems
Sector	Telecom
Sub-Sector	Network Managed Services
Occupation	Data Handling – Network Managed Services
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	NA
Next Review Date	30/06/2025
NSQC Clearance Date	30/06/2022

Qualification Pack

TEL/N6606: Develop and Assist in the Implementation of Machine Learning (ML) Systems

Description

This OS unit is about applying various techniques and processes to develop machine learning systems as per the business objectives, and assisting in their implementation.

Scope

The scope covers the following :

- Collect, clean and prepare data
- Develop relevant algorithms
- Perform data analysis
- Perform machine learning tests
- Train and retrain models
- Assist in the implementation of machine learning systems

Elements and Performance Criteria

Collect, clean and prepare data

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

- PC1.** collect appropriate data from historical database, open datasets or any other relevant data sources as per the requirement
- PC2.** carry out data cleaning to remove the irrelevant data and ensure its quality and accuracy
- PC3.** manage the data acquisition process, if more data is needed after cleaning of existing data
- PC4.** prepare the data by transforming textual and graphical data into numbers for use in the machine learning system
- PC5.** create data pipeline depending on the machine learning application needs

Develop relevant algorithms

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

- PC6.** analyses the machine learning algorithms that could be used to solve a given problem and rank them by their success probability
- PC7.** develop machine learning algorithms, such as Linear Regression, Logistic Regression, and Naive Bayes, based on statistical modelling procedures
- PC8.** ensure the algorithms can analyses large volume of historical data to make predictions and generate accurate user recommendations

Perform data analysis

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

- PC9.** explore and visualize data to gain an understanding of it
- PC10.** identify differences in data distribution that could affect performance when deploying the model in the real world
- PC11.** perform statistical analysis to resolve data set problems

Qualification Pack

PC12. solve complex problems with multi-layered data sets

PC13. use data modelling and evaluation strategy to find patterns and predict unseen instances

PC14. evaluate and transform data science prototypes

Perform machine learning tests

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

PC15. design machine learning systems/applications and self-running Artificial Intelligence (AI) software to automate predictive models

PC16. carry out machine learning tests, interpret the test results and make appropriate adjustments based on test results

PC17. carry out research and implement best practices to improve the existing machine learning infrastructure

PC18. optimize existing machine learning libraries and frameworks based on testing

PC19. create useful information from unstructured data by auto-tagging images and text-to-speech conversions

Train and retrain models

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

PC20. train models and optimize their hyper-parameters

PC21. analyses the errors of the model and develop appropriate strategies to rectify them

PC22. retrain the existing systems based on new machine learning model

PC23. document the machine learning processes as per the organizational policy

PC24. follow the latest machine learning developments and technologies

Assist in the implementation of machine learning systems

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

PC25. coordinate with data engineers to build data and model pipelines

PC26. manage the infrastructure and data pipelines needed to implement code in production

PC27. set up and maintain scalable machine learning solutions in the production

PC28. assist in deploying the models for production

PC29. assist in monitoring production to ensure production is carried out based on the developed machine learning system

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the integration of data science and software engineering in machine learning engineering

KU2. use of data and automation predictive models by a self-running software

KU3. the application of data structures, algorithms, computability and complexity and computer architecture in machine learning engineering

KU4. the application of computer science, computational linguistics, data science, mathematics, statistics, and algorithms in machine learning

KU5. the benefits and process of using Python, Java, R-code writing software, etc.

KU6. the ML frameworks, libraries, data structures, data modelling, and software architecture

Qualification Pack

- KU7.** end-to-end application of machine learning algorithms
- KU8.** the software engineering and software design processes
- KU9.** the process of explaining complex processes in simple terms
- KU10.** the process of designing and developing machine learning and deep learning systems
- KU11.** the process of running machine learning tests and experiments
- KU12.** the process of implementing appropriate ML algorithms and libraries
- KU13.** the process of exploring, visualizing and manipulating large datasets
- KU14.** the process of creating algorithms based on statistical modelling procedures
- KU15.** the process of performing relevant computations and using the relevant algorithms for programming
- KU16.** the use of data modelling and evaluation strategy to find patterns and predict unseen instances
- KU17.** the process of carrying out machine learning tests, interpreting the test results and making appropriate adjustments based on test results
- KU18.** the process of evaluating and transforming data science prototypes
- KU19.** the importance of performing data cleaning to ensure the quality of data
- KU20.** the importance of identifying differences in data distribution that could affect performance when deploying the model in the real world
- KU21.** the process of performing statistical analysis to resolve data set problems
- KU22.** the process of solving complex problems with multi-layered data sets
- KU23.** the importance of researching and implementing appropriate ML algorithms and libraries
- KU24.** the process of analysing the ML algorithms that could be used to solve a given problem and rank them by their success probability
- KU25.** the process of optimizing existing machine learning libraries and frameworks
- KU26.** the process of developing ML algorithms to analyse huge volumes of historical data to make predictions
- KU27.** the process of designing machine learning systems/ applications and self-running artificial intelligence (AI) software to automate predictive models
- KU28.** the importance of ensuring the algorithms generate accurate user recommendations
- KU29.** the process of turning unstructured data into useful information by auto-tagging images and text-to-speech conversions
- KU30.** the process of training models and optimizing their hyper-parameters
- KU31.** the process of analysing the errors of the model and developing appropriate strategies to rectify them
- KU32.** the importance of carrying out research and implementing best practices to improve the existing machine learning infrastructure
- KU33.** the process of retraining the existing systems based on new machine learning models
- KU34.** the importance of following the latest machine learning developments and technologies
- KU35.** the process of building data and model pipelines
- KU36.** the infrastructure and data pipelines needed to bring code to production
- KU37.** the process of setting up and maintaining scalable machine learning solutions in production
- KU38.** the process of deploying the models for production

Qualification Pack

KU39. the importance of monitoring production to ensure production is carried out based on the developed machine learning systems

Generic Skills (GS)

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

GS1. maintain work related records

GS2. read the relevant guides and literature to get the latest information about the field of work

GS3. communicate clearly and politely

GS4. listen attentively to understand the information/ instructions being shared

GS5. plan and priorities tasks to ensure timely completion

GS6. identify appropriate solutions to work related issues

GS7. take quick decisions in case of an emergency/accident

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Collect, clean and prepare data</i>	6	12	-	2
PC1. collect appropriate data from historical database, open datasets or any other relevant data sources as per the requirement	1	2	-	1
PC2. carry out data cleaning to remove the irrelevant data and ensure its quality and accuracy	2	2	-	-
PC3. manage the data acquisition process, if more data is needed after cleaning of existing data	1	3	-	-
PC4. prepare the data by transforming textual and graphical data into numbers for use in the machine learning system	1	3	-	-
PC5. create data pipeline depending on the machine learning application needs	1	2	-	1
<i>Develop relevant algorithms</i>	3	6	-	1
PC6. analyses the machine learning algorithms that could be used to solve a given problem and rank them by their success probability	1	2	-	1
PC7. develop machine learning algorithms, such as Linear Regression, Logistic Regression, and Naive Bayes, based on statistical modelling procedures	1	2	-	-
PC8. ensure the algorithms can analyses large volume of historical data to make predictions and generate accurate user recommendations	1	2	-	-
<i>Perform data analysis</i>	6	12	-	2
PC9. explore and visualize data to gain an understanding of it	1	2	-	1
PC10. identify differences in data distribution that could affect performance when deploying the model in the real world	1	2	-	-
PC11. perform statistical analysis to resolve data set problems	1	2	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. solve complex problems with multi-layered data sets	1	2	-	-
PC13. use data modelling and evaluation strategy to find patterns and predict unseen instances	1	2	-	1
PC14. evaluate and transform data science prototypes	1	2	-	-
<i>Perform machine learning tests</i>	5	10	-	12
PC15. design machine learning systems/applications and self-running Artificial Intelligence (AI) software to automate predictive models	1	2	-	1
PC16. carry out machine learning tests, interpret the test results and make appropriate adjustments based on test results	1	2	-	-
PC17. carry out research and implement best practices to improve the existing machine learning infrastructure	1	2	-	-
PC18. optimize existing machine learning libraries and frameworks based on testing	1	2	-	11
PC19. create useful information from unstructured data by auto-tagging images and text-to-speech conversions	1	2	-	-
<i>Train and retrain models</i>	5	10	-	2
PC20. train models and optimize their hyper-parameters	1	2	-	1
PC21. analyses the errors of the model and develop appropriate strategies to rectify them	1	2	-	-
PC22. retrain the existing systems based on new machine learning model	1	2	-	-
PC23. document the machine learning processes as per the organizational policy	1	2	-	1
PC24. follow the latest machine learning developments and technologies	1	2	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Assist in the implementation of machine learning systems</i>	5	10	-	1
PC25. coordinate with data engineers to build data and model pipelines	1	2	-	-
PC26. manage the infrastructure and data pipelines needed to implement code in production	1	2	-	-
PC27. set up and maintain scalable machine learning solutions in the production	1	2	-	1
PC28. assist in deploying the models for production	1	2	-	-
PC29. assist in monitoring production to ensure production is carried out based on the developed machine learning system	1	2	-	-
NOS Total	30	60	-	20

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N6606
NOS Name	Develop and Assist in the Implementation of Machine Learning (ML) Systems
Sector	Telecom
Sub-Sector	Network Managed Services
Occupation	Data Handling - Network Managed Services
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	NA
Next Review Date	30/06/2025
NSQC Clearance Date	30/06/2022

Qualification Pack

TEL/N9103: Implement Effective Interaction at workplace

Description

This OS unit is about communicating with superiors and colleagues as well as customers and other stakeholders in own or other work groups within as well as outside the organisation

Scope

The scope covers the following :

- Interact effectively with superiors
- Interact effectively with colleagues and customers
- Respect differences of gender and ability

Elements and Performance Criteria

Interact effectively with superiors

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

- PC1.** interpret work requirements from the superior and customers
- PC2.** report any unforeseen disruptions or delays to superiors and/or concerned person
- PC3.** achieve productivity and quality of work as per the company procedure

Interact effectively with colleagues and customers

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

- PC4.** explain the work requirements and the scope of work to the team
- PC5.** communicate information using different techniques such as face-to-face, telephonic and written means
- PC6.** co-ordinate with team to integrate work as per requirements
- PC7.** respect colleagues and customers and communicate taking care of their personal spaces
- PC8.** find solutions to work related difficulties with mutual agreement with colleagues and customers
- PC9.** resolve conflicts within the team at work to achieve smooth workflow
- PC10.** motivate team members to put organizational goals over individual goals
- PC11.** encourage the team to provide feedback on any issues facing them

Respect differences of gender and ability

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

- PC12.** ensure personal behaviour of self and team is conducted taking gender and disability of the person into consideration
- PC13.** demonstrate sensitivity towards gender and person with disability while communicating
- PC14.** list the different types of disabilities with their respective issues
- PC15.** provide help to PwD team members in overcoming any challenges faced in work
- PC16.** use inclusive language irrespective of the disability and the gender of the person
- PC17.** treat all colleagues and co-workers equally

Qualification Pack

PC18. respect personal space of colleagues and co-workers

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** importance of effective and different means of communication and establishing good working relationships with colleagues and superiors
- KU2.** importance of helping colleagues with problems, in order to meet quality and time standards as a team
- KU3.** different methods of communication
- KU4.** different types of information that colleagues might need and the importance of providing this information in an appropriate manner
- KU5.** helping colleagues with problems, in order to meet quality and time standards as a team
- KU6.** organisation's policies and procedures for working with colleagues and superior
- KU7.** implications of own work on the work and schedule of others
- KU8.** importance of understanding consequences of gender based behaviour
- KU9.** gender based concepts, issues and legislation
- KU10.** organisation standards and guidelines to be followed for PwD and knowledge about laws, acts and provisions defined for PwD by the statutory bodies and the right way to use them including various medical conditions associated with PwD
- KU11.** health and safety requirements at workplace for PwD
- KU12.** rights and duties at workplace with respect to PwD
- KU13.** process of recruiting people for a particular job profile w.r.t PwD and gender
- KU14.** various government / private schemes and benefits available for PwD and information about various institutes working for PwD to enable in providing livelihood opportunities for PwD

Generic Skills (GS)

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

- GS1.** complete written work with attention to detail and read instructions/guidelines/procedures
- GS2.** listen effectively and orally communicate information
- GS3.** ask for clarification and advice from the concerned person
- GS4.** deliver consistent and reliable service to customers
- GS5.** check that the work meets customer requirements
- GS6.** practice and acceptance of gender and its concepts
- GS7.** develop empathy across genders and towards PwD
- GS8.** reflect on own gender identity, gender roles and PwD issues
- GS9.** engage and participate in discussions to end gender and disability discrimination
- GS10.** improve and modify work practices
- GS11.** maintain positive and effective relationships with colleagues and customers
- GS12.** evaluate the possible solution(s) to the problem

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Interact effectively with superiors</i>	2	9	-	1
PC1. interpret work requirements from the superior and customers	1	2	-	-
PC2. report any unforeseen disruptions or delays to superiors and/or concerned person	1	2	-	1
PC3. achieve productivity and quality of work as per the company procedure	-	5	-	-
<i>Interact effectively with colleagues and customers</i>	13	27	-	5
PC4. explain the work requirements and the scope of work to the team	2	3	-	-
PC5. communicate information using different techniques such as face-to-face, telephonic and written means	2	4	-	1
PC6. co-ordinate with team to integrate work as per requirements	-	4	-	1
PC7. respect colleagues and customers and communicate taking care of their personal spaces	-	3	-	-
PC8. find solutions to work related difficulties with mutual agreement with colleagues and customers	3	3	-	-
PC9. resolve conflicts within the team at work to achieve smooth workflow	-	4	-	1
PC10. motivate team members to put organizational goals over individual goals	3	4	-	1
PC11. encourage the team to provide feedback on any issues facing them	3	2	-	1
<i>Respect differences of gender and ability</i>	15	24	-	4
PC12. ensure personal behaviour of self and team is conducted taking gender and disability of the person into consideration	2	4	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. demonstrate sensitivity towards gender and person with disability while communicating	2	3	-	1
PC14. list the different types of disabilities with their respective issues	2	3	-	1
PC15. provide help to PwD team members in overcoming any challenges faced in work	2	3	-	-
PC16. use inclusive language irrespective of the disability and the gender of the person	2	3	-	1
PC17. treat all colleagues and co-workers equally	2	3	-	-
PC18. respect personal space of colleagues and co-workers	3	5	-	1
NOS Total	30	60	-	10

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N9103
NOS Name	Implement Effective Interaction at workplace
Sector	Telecom
Sub-Sector	Generic
Occupation	Generic
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	31/03/2022
Next Review Date	30/06/2025
NSQC Clearance Date	30/06/2022

Qualification Pack

TEL/N9104: Manage Work, Resources and Safety at workplace

Description

This OS unit is about planning work and implementing sustainable as well as healthy practices for safety and optimal use of resources

Scope

The scope covers the following :

- Manage learning and self-direction
- Develop critical thinking and problem solving
- Perform work as per quality standards
- Maintain safe and secure working environment
- Comply with material / energy / electricity conservation practices

Elements and Performance Criteria

Manage learning and self-direction

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

- PC1.** develop technical and personal skills to be updated with new technologies prevalent in the industry
- PC2.** train the team such that they are able to adapt latest products/services in their working environment
- PC3.** identify opportunities for team building workshops and motivational trainings

Develop critical thinking and problem solving

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

- PC4.** guide the team to be accountable for timely completion of tasks
- PC5.** analyse problems accurately to be able to correctly suggest suitable solutions to the concerned persons
- PC6.** train the team to estimate the cause of the problem and validate

Perform work as per quality standards

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

- PC7.** implement ways to keep immediate as well as team's work area clean and tidy
- PC8.** maintain efficiency and productivity while performing role/responsibility
- PC9.** supervise the team to ensure that the work is done as per the assigned and agreed requirements
- PC10.** create schedules and rosters for the team to ensure they understand individual work requirements

Maintain safe and secure working environment

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

- PC11.** identify organisation's health, safety, security policies and procedures

Qualification Pack

- PC12.** instruct team to report any identified breaches in health, safety, and security policies and procedures to the designated person
- PC13.** manage hazards such as illness, accidents, fires or any other natural calamity safely, as per organisation's emergency procedures, within the limits of individual's authority
- PC14.** report any hazard outside the individual's authority to the relevant person in line with organisational procedures and warn others who may be affected

Material / energy / electricity conservation practices

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

- PC15.** implement ways to optimize usage of material including water in various tasks/activities/processes
- PC16.** supervise the team to ensure responsible use of resources
- PC17.** motivate the team to carry out routine cleaning of tools, machine and equipment
- PC18.** guide the team to optimize use of electricity/energy in various tasks/activities/processes
- PC19.** implement periodic checks of the functioning of the equipment/machine and rectify wherever required
- PC20.** guide the team to report malfunctioning and lapses in maintenance of equipment
- PC21.** implement ways to use electrical equipment and appliances properly

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** strategies pertinent to the field that can be used to pursue an advancement of skills
- KU2.** key performance indicators for the new tasks
- KU3.** feedback processes and formats
- KU4.** timelines and goals as well as their relevance to work allocated
- KU5.** importance of quality and timely delivery of the product/service
- KU6.** layout of the workstation and equipment used
- KU7.** escalation matrix and its importance, especially in case of emergencies
- KU8.** ways of time and cost management
- KU9.** rules/regulation for maintaining health and safety at workplace
- KU10.** meaning of hazard, different types of health and safety hazards found in the workplace, risks and threats based on the nature of work
- KU11.** procedures to report breaches in health, safety and security
- KU12.** ways of managing resources and material efficiently
- KU13.** ways to recognize common electrical problems and common practices of conserving electricity

Generic Skills (GS)

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

- GS1.** explore various pathways to expand one's own learning skills and abilities

Qualification Pack

- GS2.** analyse feedback for improving one's way of working
- GS3.** interpret feedback from superiors in a constructive way
- GS4.** identify the root cause of problems
- GS5.** understand the problem by asking significant questions to clarify the various points of view on the problem
- GS6.** seek clarifications from superior about the job requirement
- GS7.** work in a team with full coordination of team members
- GS8.** read instructions/guidelines and Standard Operating Practices (SOP) documents
- GS9.** complete tasks efficiently and accurately within stipulated time
- GS10.** record data in statutory documents relevant to safety and hygiene
- GS11.** escalate/refer all anomalies to the concerned persons
- GS12.** identify the most suitable course of action for completing the task using provided resources

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Manage learning and self-direction</i>	4	5	-	-
PC1. develop technical and personal skills to be updated with new technologies prevalent in the industry	2	1	-	-
PC2. train the team such that they are able to adapt latest products/services in their working environment	1	2	-	-
PC3. identify opportunities for team building workshops and motivational trainings	1	2	-	-
<i>Develop critical thinking and problem solving</i>	4	7	-	-
PC4. guide the team to be accountable for timely completion of tasks	2	3	-	-
PC5. analyse problems accurately to be able to correctly suggest suitable solutions to the concerned persons	1	2	-	-
PC6. train the team to estimate the cause of the problem and validate	1	2	-	-
<i>Perform work as per quality standards</i>	5	9	-	4
PC7. implement ways to keep immediate as well as team's work area clean and tidy	1	2	-	-
PC8. maintain efficiency and productivity while performing role/responsibility	1	2	-	2
PC9. supervise the team to ensure that the work is done as per the assigned and agreed requirements	1	2	-	1
PC10. create schedules and rosters for the team to ensure they understand individual work requirements	2	3	-	1
<i>Maintain safe and secure working environment</i>	12	13	-	2
PC11. identify organisation's health, safety, security policies and procedures	3	3	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. instruct team to report any identified breaches in health, safety, and security policies and procedures to the designated person	3	3	-	-
PC13. manage hazards such as illness, accidents, fires or any other natural calamity safely, as per organisation's emergency procedures, within the limits of individual's authority	3	4	-	1
PC14. report any hazard outside the individual's authority to the relevant person in line with organisational procedures and warn others who may be affected	3	3	-	1
<i>Material / energy / electricity conservation practices</i>	15	16	-	4
PC15. implement ways to optimize usage of material including water in various tasks/activities/processes	1	2	-	1
PC16. supervise the team to ensure responsible use of resources	2	2	-	1
PC17. motivate the team to carry out routine cleaning of tools, machine and equipment	2	2	-	1
PC18. guide the team to optimize use of electricity/energy in various tasks/activities/processes	3	4	-	-
PC19. implement periodic checks of the functioning of the equipment/machine and rectify wherever required	2	2	-	1
PC20. guide the team to report malfunctioning and lapses in maintenance of equipment	3	2	-	-
PC21. implement ways to use electrical equipment and appliances properly	2	2	-	-
NOS Total	40	50	-	10

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N9104
NOS Name	Manage Work, Resources and Safety at workplace
Sector	Telecom
Sub-Sector	Generic
Occupation	Generic
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	31/03/2022
Next Review Date	30/06/2025
NSQC Clearance Date	30/06/2022

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each Element/PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
6. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass % aggregate for the QP.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Qualification Pack

Minimum Aggregate Passing % at QP Level : 70

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

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
TEL/N6605.Prepare to Develop Machine Learning (ML) Systems	35	50	0	15	100	25
TEL/N6606.Develop and Assist in the Implementation of Machine Learning (ML) Systems	30	60	0	20	110	25
TEL/N9103.Implement Effective Interaction at workplace	30	60	-	10	100	25
TEL/N9104.Manage Work, Resources and Safety at workplace	40	50	-	10	100	25
Total	135	220	-	55	410	100

Qualification Pack

Acronyms

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

Qualification Pack

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.

Qualification Pack

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.