



Telecom Embedded Hardware Developer

QP Code: TEL/Q2303

Version: 2.0

NSQF Level: 4

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

Qualification Pack

Contents

TEL/Q2303: Telecom Embedded Hardware Developer	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/N2311: Develop Embedded Hardware	5
TEL/N2312: Develop Embedded Firmware	10
TEL/N9101: Organise Work and Resources as per Health and Safety Standards	14
TEL/N9102: Interact Effectively with Team Members and Customers	21
Assessment Guidelines and Weightage	25
<i>Assessment Guidelines</i>	25
<i>Assessment Weightage</i>	26
Acronyms	27
Glossary	28

Qualification Pack

TEL/Q2303: Telecom Embedded Hardware Developer

Brief Job Description

The individual is responsible for dealing with industry standard design techniques, flows and tools involved in design and maintenance of telecom embedded hardware designs, systems and products.

Personal Attributes

This job requires the individual to be analytical and be able to handle high-pressure situations to successfully perform the assigned responsibilities. They should have basic knowledge of electronics, embedded programming, written and oral communication skills and should be able to apply practical judgment to successfully perform the assigned responsibilities.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [TEL/N2311: Develop Embedded Hardware](#)
2. [TEL/N2312: Develop Embedded Firmware](#)
3. [TEL/N9101: Organise Work and Resources as per Health and Safety Standards](#)
4. [TEL/N9102: Interact Effectively with Team Members and Customers](#)

Qualification Pack (QP) Parameters

Sector	Telecom
Sub-Sector	Handset
Occupation	Terminal Equipment Application Developer
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3114.1501

Qualification Pack

Minimum Educational Qualification & Experience	12th Class OR 10th Class + I.T.I OR Diploma (Science/Electronics/Telecom/IT and other relevant fields)
Minimum Level of Education for Training in School	12th Class
Pre-Requisite License or Training	NA
Minimum Job Entry Age	17 Years
Last Reviewed On	27/01/2022
Next Review Date	27/01/2026
NSQC Approval Date	27/01/2022
Version	2.0
Reference code on NQR	2022/TEL/TSSC/05285
NQR Version	1.0

Qualification Pack

TEL/N2311: Develop Embedded Hardware

Description

This OS unit is about dealing with techniques, flows and tools involved in design and development of telecom embedded hardware products.

Scope

The scope covers the following :

- Develop embedded hardware peripherals
- Configure embedded system

Elements and Performance Criteria

Develop the embedded hardware peripherals

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

- PC1.** perform activities such as requirement definition to derive technical specification of embedded products
- PC2.** select components for the hardware design such as micro-controllers, real time data acquisition, control components and sensors
- PC3.** perform hardware-software design partitioning
- PC4.** create design of peripheral interfaces for communication protocols such as Universal Asynchronous Receiver and Transmitter (UART), Infrared, I2C, SPI, Radio Frequency (RF), Global System for Mobile Communications (GSM), Global Positioning System (GPS), Ethernet, Quad Serial Peripheral Interface (QSPI), Zigbee, Wi-Fi and Bluetooth
- PC5.** create design of circuits for embedded products and develop the circuits
- PC6.** implement steps to simulate digital and analog circuits using simulation tools
- PC7.** generate the Printed Circuit Board (PCB) schematic and layout
- PC8.** design the layout using the defined properties of the layout like width, height, background etc. in XML based on the requirements
- PC9.** develop small, intelligent communication and networking gadgets and applications

Configure the embedded system

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

- PC10.** implement steps to track the system installation activities
- PC11.** prepare the record and report the problems to the supervisor, if required
- PC12.** monitor the progress or delay in problem resolution
- PC13.** implement steps for circuit testing, integration and debugging to support embedded products

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

Qualification Pack

- KU1.** organisation SOP regarding design and development of embedded hardware
- KU2.** basics of embedded hardware design for telecom devices and equipment
- KU3.** types of communication protocols
- KU4.** functionalities of the applications, hardware and interfaces
- KU5.** basics of circuits and architectures used in telecom systems and devices

Generic Skills (GS)

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

- GS1.** read and comprehend system requirement specifications and standard operating procedure
- GS2.** prioritize tasks to achieve efficiency
- GS3.** communicate in the local language (preferable)
- GS4.** work systematically with attention-to-detail
- GS5.** fill up record sheets clearly, concisely and accurately as per organisation procedures
- GS6.** prepare status and progress reports
- GS7.** communicate progress and delays to the supervisor in a timely manner
- GS8.** communicate task lists, schedules, and work-loads with co-workers

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Develop the embedded hardware peripherals</i>	35	27	-	11
PC1. perform activities such as requirement definition to derive technical specification of embedded products	4	3	-	1
PC2. select components for the hardware design such as micro-controllers, real time data acquisition, control components and sensors	4	3	-	1
PC3. perform hardware-software design partitioning	4	3	-	1
PC4. create design of peripheral interfaces for communication protocols such as Universal Asynchronous Receiver and Transmitter (UART), Infrared, I2C, SPI, Radio Frequency (RF), Global System for Mobile Communications (GSM), Global Positioning System (GPS), Ethernet, Quad Serial Peripheral Interface (QSPI), Zigbee, Wi-Fi and Bluetooth	5	5	-	3
PC5. create design of circuits for embedded products and develop the circuits	4	3	-	1
PC6. implement steps to simulate digital and analog circuits using simulation tools	3	2	-	1
PC7. generate the Printed Circuit Board (PCB) schematic and layout	3	2	-	1
PC8. design the layout using the defined properties of the layout like width, height, background etc. in XML based on the requirements	4	3	-	1
PC9. develop small, intelligent communication and networking gadgets and applications	4	3	-	1
<i>Configure the embedded system</i>	15	8	-	4
PC10. implement steps to track the system installation activities	4	2	-	1

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. prepare the record and report the problems to the supervisor, if required	4	2	-	1
PC12. monitor the progress or delay in problem resolution	4	2	-	1
PC13. implement steps for circuit testing, integration and debugging to support embedded products	3	2	-	1
NOS Total	50	35	-	15

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N2311
NOS Name	Develop Embedded Hardware
Sector	Telecom
Sub-Sector	Handset
Occupation	Terminal Equipment Application Developer
NSQF Level	4
Credits	TBD
Version	2.0
Last Reviewed Date	27/01/2022
Next Review Date	27/01/2026
NSQC Clearance Date	27/01/2022

Qualification Pack

TEL/N2312: Develop Embedded Firmware

Description

This OS unit is about dealing with techniques, flows and tools involved in the design and development of telecom embedded firmware.

Scope

The scope covers the following :

- Develop the embedded telecom firmware
- Troubleshoot and maintain the telecom equipment and communication protocols

Elements and Performance Criteria

Develop the embedded telecom firmware

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

- PC1.** use programming tools (e.g. GNU compiler collection (GCC), GNU project debugger (GDB)) and eclipse and integrated design environments for hardware-software co-design
- PC2.** develop memory efficient and optimal code for firmware such as micro-controllers and other programmable devices using C/C++ and embedded programming language
- PC3.** develop wireless connectivity stacks/firmware for communication protocols including, but not limited to Zigbee, Bluetooth, Transmission Control Protocol/Internet protocol (TCP/IP), Serial Peripheral Interface (SPI), Inter-Integrated Circuit (I2C), Universal Serial Bus (USB), RS232, RS485

Troubleshoot and maintain the telecom equipment and communication protocols

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

- PC4.** perform maintenance of firmware for telecom equipment and support data communication equipment and services
- PC5.** maintain firmware of network systems based on communication protocols interfaces
- PC6.** implement techniques to troubleshoot the telecom equipment
- PC7.** perform testing and verification of the firmware design and the prototype and report to supervisor, in case of any problem
- PC8.** maintain service feedback files and documents

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** organisation SOP regarding design and development of embedded firmware
- KU2.** concepts of embedded firmware design for telecom devices and equipment
- KU3.** programming languages like C, C++
- KU4.** application of programming tools
- KU5.** working of communication protocols in embedded systems like Zigbee, Bluetooth, IP, TCP etc.

Qualification Pack

- KU6.** troubleshooting procedure for embedded firmware
- KU7.** organization reporting and documentation procedure

Generic Skills (GS)

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

- GS1.** read and comprehend system requirement specifications, test specifications and standard operating procedure
- GS2.** prioritize tasks to achieve efficiency
- GS3.** communicate in the local language (preferable)
- GS4.** fill up record sheets clearly, concisely and accurately as per organisation procedures
- GS5.** prepare status and progress reports

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Develop the embedded telecom firmware</i>	11	24	-	3
PC1. use programming tools (e.g. GNU compiler collection (GCC), GNU project debugger (GDB)) and eclipse and integrated design environments for hardware-software co-design	3	8	-	1
PC2. develop memory efficient and optimal code for firmware such as micro-controllers and other programmable devices using C/C++ and embedded programming language	3	8	-	1
PC3. develop wireless connectivity stacks/firmware for communication protocols including, but not limited to Zigbee, Bluetooth, Transmission Control Protocol/Internet protocol (TCP/IP), Serial Peripheral Interface (SPI), Inter-Integrated Circuit (I2C), Universal Serial Bus (USB), RS232, RS485	5	8	-	1
<i>Troubleshoot and maintain the telecom equipment and communication protocols</i>	19	36	-	7
PC4. perform maintenance of firmware for telecom equipment and support data communication equipment and services	3	8	-	2
PC5. maintain firmware of network systems based on communication protocols interfaces	3	8	-	1
PC6. implement techniques to troubleshoot the telecom equipment	4	6	-	1
PC7. perform testing and verification of the firmware design and the prototype and report to supervisor, in case of any problem	6	8	-	2
PC8. maintain service feedback files and documents	3	6	-	1
NOS Total	30	60	-	10

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N2312
NOS Name	Develop Embedded Firmware
Sector	Telecom
Sub-Sector	Handset
Occupation	Terminal Equipment Application Developer
NSQF Level	4
Credits	TBD
Version	2.0
Last Reviewed Date	27/01/2022
Next Review Date	27/01/2026
NSQC Clearance Date	27/01/2022

Qualification Pack

TEL/N9101: Organise Work and Resources as per Health and Safety Standards

Description

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

Scope

The scope covers the following :

- Perform work as per quality standards
- Maintain safe, healthy and secure working environment
- Conserve material/energy/electricity
- Use effective waste management/recycling practices

Elements and Performance Criteria

Perform work as per quality standards

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

- PC1.** keep workspace clean and tidy
- PC2.** perform individual role and responsibilities as per the job role while taking accountability for the work
- PC3.** record/document tasks completed as per the requirements within specific timelines
- PC4.** implement schedules to ensure timely completion of tasks
- PC5.** identify the cause of a problem related to own work and validate it
- PC6.** analyse problems accurately and communicate different possible solutions to the problem

Maintain safe, healthy and secure working environment

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

- PC7.** comply with organisation's current health, safety, security policies and procedures
- PC8.** check for water spills in and around the work space and escalate these to the appropriate authority
- PC9.** report any identified breaches in health, safety, and security policies and procedures to the designated person
- PC10.** use safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc.
- PC11.** avoid damage of components due to negligence in ESD procedures or any other loss due to safety negligence
- PC12.** identify 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
- PC13.** participate regularly in fire drills or other safety related workshops organised by the company
- 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

Qualification Pack

- PC15.** maintain appropriate posture while sitting/standing for long hours
- PC16.** handle heavy and hazardous materials with care, while maintaining appropriate posture
- PC17.** sanitize workstation and equipment regularly
- PC18.** clean hands with soap, alcohol-based sanitizer regularly
- PC19.** avoid contact with anyone suffering from communicable diseases and take necessary precautions
- PC20.** take safety precautions while travelling e.g. maintain 1m distance from others, sanitize hands regularly, wear masks, etc.
- PC21.** report hygiene and sanitation issues to appropriate authority
- PC22.** follow recommended personal hygiene and sanitation practices, for example, washing/sanitizing hands, covering face with a bent elbow while coughing/sneezing, using PPE, etc.

Conserve material/energy/electricity

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

- PC23.** optimize usage of material including water in various tasks/activities/processes
- PC24.** use resources such as water, electricity and others responsibly
- PC25.** carry out routine cleaning of tools, machine and equipment
- PC26.** optimize use of electricity/energy in various tasks/activities/processes
- PC27.** perform periodic checks of the functioning of the equipment/machine and rectify wherever required
- PC28.** report malfunctioning and lapses in maintenance of equipment
- PC29.** use electrical equipment and appliances properly

Use effective waste management/recycling practices

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

- PC30.** identify recyclable, non-recyclable and hazardous waste
- PC31.** deposit recyclable and reusable material at identified location
- PC32.** dispose non-recyclable and hazardous waste as per recommended processes

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** strategies pertinent to their field (such as internet searches, asking peers and managers, enrolling for courses and certifications, etc.) that can be used to pursue an advancement in their 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.** escalation matrix and its importance, especially in case of emergencies
- KU7.** ways of time and cost management
- KU8.** rules/regulation for maintaining health and safety at workplace

Qualification Pack

- KU9.** meaning of hazard, different types of health and safety hazards found in the workplace, risks and threats based on the nature of work
- KU10.** relevant signage, warnings, labels or descriptions on equipment, etc. while carrying out work activities
- KU11.** procedures to report breaches in health, safety and security
- KU12.** organisation's procedures for different emergency situations and the importance of following the same
- KU13.** different methods of cleaning, disinfection, sterilization, and sanitization
- KU14.** significance of personal hygiene practice including hand hygiene
- KU15.** path of disease transmission
- KU16.** correct method of donning and doffing of PPE
- KU17.** ways of managing resources and material efficiently
- KU18.** common electrical problems and common practices of conserving electricity
- KU19.** categorization of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics and use of different colours of dustbins
- KU20.** organisation's procedures for minimizing waste
- KU21.** waste management and methods of waste disposal
- KU22.** common sources of pollution and ways to minimize it

Generic Skills (GS)

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

- GS1.** improve and modify work practices
- GS2.** complete tasks efficiently and accurately within stipulated time
- GS3.** develop skills and mastery of the technologies prevalent in the industry
- GS4.** write in at least one language and complete written work with attention to detail
- GS5.** utilize time and manage workload efficiently
- GS6.** read and comprehend instructions and documents
- GS7.** accept feedback in a constructive way
- GS8.** seek clarifications from superior about the job requirement
- GS9.** read and comprehend statutory documents relevant to safety and hygiene
- GS10.** refer all anomalies to the concerned persons
- GS11.** analyze situations and make appropriate decisions
- GS12.** decide the most suitable course of action for completing the task within resources

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Perform work as per quality standards</i>	4	9	-	2
PC1. keep workspace clean and tidy	-	1	-	-
PC2. perform individual role and responsibilities as per the job role while taking accountability for the work	1	1	-	1
PC3. record/document tasks completed as per the requirements within specific timelines	-	1	-	1
PC4. implement schedules to ensure timely completion of tasks	-	2	-	-
PC5. identify the cause of a problem related to own work and validate it	2	2	-	-
PC6. analyse problems accurately and communicate different possible solutions to the problem	1	2	-	-
<i>Maintain safe, healthy and secure working environment</i>	16	27	-	4
PC7. comply with organisation's current health, safety, security policies and procedures	1	1	-	-
PC8. check for water spills in and around the work space and escalate these to the appropriate authority	1	2	-	1
PC9. report any identified breaches in health, safety, and security policies and procedures to the designated person	1	2	-	1
PC10. use safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc.	1	2	-	1
PC11. avoid damage of components due to negligence in ESD procedures or any other loss due to safety negligence	2	3	-	1
PC12. identify 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	2	1	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. participate regularly in fire drills or other safety related workshops organised by the company	1	3	-	-
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	1	3	-	-
PC15. maintain appropriate posture while sitting/standing for long hours	1	1	-	-
PC16. handle heavy and hazardous materials with care, while maintaining appropriate posture	1	1	-	-
PC17. sanitize workstation and equipment regularly	1	2	-	-
PC18. clean hands with soap, alcohol-based sanitizer regularly	-	1	-	-
PC19. avoid contact with anyone suffering from communicable diseases and take necessary precautions	-	1	-	-
PC20. take safety precautions while travelling e.g. maintain 1m distance from others, sanitize hands regularly, wear masks, etc.	1	2	-	-
PC21. report hygiene and sanitation issues to appropriate authority	1	1	-	-
PC22. follow recommended personal hygiene and sanitation practices, for example, washing/sanitizing hands, covering face with a bent elbow while coughing/sneezing, using PPE, etc.	1	1	-	-
<i>Conserve material/energy/electricity</i>	7	16	-	3
PC23. optimize usage of material including water in various tasks/activities/processes	1	2	-	-
PC24. use resources such as water, electricity and others responsibly	1	2	-	1
PC25. carry out routine cleaning of tools, machine and equipment	1	2	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC26. optimize use of electricity/energy in various tasks/activities/processes	1	3	-	1
PC27. perform periodic checks of the functioning of the equipment/machine and rectify wherever required	1	3	-	1
PC28. report malfunctioning and lapses in maintenance of equipment	1	2	-	-
PC29. use electrical equipment and appliances properly	1	2	-	-
<i>Use effective waste management/recycling practices</i>	3	8	-	1
PC30. identify recyclable, non-recyclable and hazardous waste	1	2	-	1
PC31. deposit recyclable and reusable material at identified location	1	3	-	-
PC32. dispose non-recyclable and hazardous waste as per recommended processes	1	3	-	-
NOS Total	30	60	-	10

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N9101
NOS Name	Organise Work and Resources as per Health and Safety Standards
Sector	Telecom
Sub-Sector	Generic
Occupation	Generic
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	24/02/2022
Next Review Date	24/02/2026
NSQC Clearance Date	24/02/2022

Qualification Pack

TEL/N9102: Interact Effectively with Team Members and Customers

Description

This OS unit is about interacting 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.** receive work requirements from superiors and customers and interpret them correctly
- PC2.** inform the supervisor and/or concerned person about any unforeseen disruptions or delays
- PC3.** participate in decision making by providing facts and figures, giving/accepting constructive suggestions
- PC4.** rectify errors as per feedback and ensure the errors are not repeated

Interact effectively with colleagues and customers

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

- PC5.** comply with organisation's policies and procedures for working with team members
- PC6.** communicate professionally using appropriate mode of communication such as face-to-face, telephonic and written
- PC7.** respond to queries and seek/provide clarifications if required
- PC8.** co-ordinate with team to integrate work as per requirements
- PC9.** resolve conflicts within the team/with customers to achieve smooth workflow
- PC10.** recognize emotions accurately in self and others to build good relationships
- PC11.** prioritize team and organization goals above personal goals

Respect differences of gender and ability

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

- PC12.** maintain a conducive environment for all the genders at the workplace
- PC13.** encourage appropriate behavior and conduct with people across gender
- PC14.** assist team members with disability in overcoming any challenges faced in work
- PC15.** practice appropriate verbal and non-verbal communication while interacting with People with Disability (PwD)
- PC16.** ensure equal participation of the people across genders in discussions

Knowledge and Understanding (KU)

Qualification Pack

The individual on the job needs to know and understand:

- KU1.** organisation's policies on dress code, workplace timings, workplace behaviour, performance management, incentives, delivery standards, information security, etc.
- KU2.** organisation's hierarchy and escalation matrix
- KU3.** importance of establishing good working relationships with colleagues and superiors
- KU4.** importance of helping colleagues with problems, in order to meet quality and time standards as a team
- KU5.** different means and methods of communication
- KU6.** different types of information that colleagues might need and the importance of providing this information in an appropriate manner
- KU7.** organisation's policies and procedures for working with colleagues and superiors
- KU8.** importance of understanding consequences of gender biased 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.** process of recruiting people for a particular job profile w.r.t PwD and gender
- KU13.** 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.** read and comprehend forms, documents and records
- GS2.** read and write in English and/or local language
- GS3.** complete work with attention to detail
- GS4.** listen effectively and orally communicate information
- GS5.** work as per customer requirements
- GS6.** communicate with empathy across genders and PwD
- GS7.** improve and modify work practices
- GS8.** maintain positive and effective relationships with colleagues and customers
- GS9.** 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>	7	15	-	2
PC1. receive work requirements from superiors and customers and interpret them correctly	1	2	-	-
PC2. inform the supervisor and/or concerned person about any unforeseen disruptions or delays	2	4	-	1
PC3. participate in decision making by providing facts and figures, giving/accepting constructive suggestions	2	5	-	1
PC4. rectify errors as per feedback and ensure the errors are not repeated	2	4	-	-
<i>Interact effectively with colleagues and customers</i>	7	26	-	4
PC5. comply with organisation's policies and procedures for working with team members	1	2	-	-
PC6. communicate professionally using appropriate mode of communication such as face-to-face, telephonic and written	2	4	-	1
PC7. respond to queries and seek/provide clarifications if required	2	4	-	1
PC8. co-ordinate with team to integrate work as per requirements	-	3	-	-
PC9. resolve conflicts within the team/with customers to achieve smooth workflow	1	5	-	1
PC10. recognize emotions accurately in self and others to build good relationships	1	4	-	-
PC11. prioritize team and organization goals above personal goals	-	4	-	1
<i>Respect differences of gender and ability</i>	11	24	-	4
PC12. maintain a conducive environment for all the genders at the workplace	2	5	-	1

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. encourage appropriate behavior and conduct with people across gender	2	5	-	1
PC14. assist team members with disability in overcoming any challenges faced in work	3	4	-	1
PC15. practice appropriate verbal and non-verbal communication while interacting with People with Disability (PWD)	2	4	-	1
PC16. ensure equal participation of the people across genders in discussions	2	6	-	-
NOS Total	25	65	-	10

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N9102
NOS Name	Interact Effectively with Team Members and Customers
Sector	Telecom
Sub-Sector	Generic
Occupation	Generic
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	24/02/2022
Next Review Date	24/02/2026
NSQC Clearance Date	24/02/2022

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each 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 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.
- 4a. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
- 4b. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion.
5. To pass the Qualification Pack , every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
6. 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/N2311.Develop Embedded Hardware	50	35	0	15	100	25
TEL/N2312.Develop Embedded Firmware	30	60	0	10	100	25
TEL/N9101.Organise Work and Resources as per Health and Safety Standards	30	60	-	10	100	25
TEL/N9102.Interact Effectively with Team Members and Customers	25	65	-	10	100	25
Total	135	220	-	45	400	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.