

Model Curriculum

Telecom -Wireless Technician

SECTOR: TELECOM

SUB-SECTOR: PASSIVE INFRASTRUCTURE

OCCUPATION: OPERATION & MAINTENANCE

REF ID: TEL/Q4105,V1.0

NSQF LEVEL: 4



Certificate

COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

TELECOM SECTOR SKILL COUNCIL

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: **'Wireless Technician'**
QP No. **'TEL/Q4105 NSQF Level 4'**

Date of Issuance: November 23rd, 2016

Valid up to: November 23rd, 2018

* Valid up to the next review date of the Qualification Pack

Authorised Signatory
(Telecom Skill Development Council)

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Telecom- Wireless Technician

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Telecom –Wireless Technician”, in the “Telecom” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Telecom - Wireless Technician		
Qualification Pack Name & Reference ID. ID	TEL/Q4105,Version 1.0		
Version No.	1.0	Version Update Date	10/7/2016
Pre-requisites to Training	Preferably equivalent to 10+2		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Acquaint self with wiring & equipment installation of WiFi Backhaul equipment and WiFi Access Points. • Undertake wiring and install system hardware, cable route from Point of Presence(PoP) to WiFi Backhaul site and Access Points. • Configuration & Establish connectivity between Wi-Fi Backhaul equipment, Access Points, Service Provider Gateway and End user devices. • Troubleshoot Wi-Fi backhaul equipment., Access Points, Cable, Connectors Service Provider Gateway, End user devices. • Installation & maintenance of UPS and regular monitoring of electrical parameters. • Identify importance of site hygiene: Maintain and monitor the Eqpt, battery bank and surrounding area. • Aggregate potential knowledge and skill to vouchsafe the importance of health and safety: Safeguard compliance of safety regulations, personal protection, fire regulation and environmental condition. • Comprehend and initiate importance of documentation: Maintain checklist, reports, and issues for future reference. 		

This course encompasses 4 out of 4 National Occupational Standards (NOS) of “Telecom - Wireless Technician” Qualification Pack issued by “Telecom Sector Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Wi-Fi Backhaul Equipment & Wi-Fi Access Points wiring and installation at different sites</p> <p>Theory Duration (hh:mm) 40:00</p> <p>Practical Duration (hh:mm) 40:00</p> <p>Corresponding NOS Code TEL/N4122 TEL/N4125</p>	<ul style="list-style-type: none"> Understand General Discipline in the class room (Do’s & Don’ts) Learn about the telecom industry Develop understanding about the Telecom Infrastructure industry. Understand Role of a Wireless Technician. Differentiate between various technologies used in Telecom Networks for Wi-Fi Backhaul and Access Points. Understand about the various equipment deployed at a Wi-Fi Backhaul site & Access Point site . Know about the tools, equipment & material used in installing Wi-Fi Backhaul site & Access Point sites. Know about the UPS & Battery used in installing Wi-Fi Backhaul site & Access Point site. Know about the Pole / Tower, Mounting of Antenna fixture and Antenna and connectivity between Antenna and the Wi-Fi equipment. 	NA
2	<p>Configuration of Equipment and establishing connectivity</p> <p>Theory Duration (hh:mm) 40:00</p> <p>Practical Duration (hh:mm) 40:00</p> <p>Corresponding NOS Code TEL/N4122 TEL/N4123</p>	<ul style="list-style-type: none"> Explaining indicators, Gen Configuration, Display Measurements Learning block diagram. Learning network topologies, broadband network elements, Gateways, TCP/IP, IP address, subnet masks, Ethernet Address, MAC Address, IPv4, IPv6, basic commands like ping & IP configuration etc. Explaining how to use Test instruments like Cable and Antenna Tester, Handheld Network Tester, and demonstrate the same in practical session. Explaining how to use laptop / PC for configuration of WiFi eqpt, Access point and connecting the same to service provider gateway. Demonstrate in practical session. 	

3	<p>Troubleshoot to localize and rectify fault.</p> <p>Theory Duration (hh:mm) 30:00</p> <p>Practical Duration (hh:mm) 30:00</p> <p>Corresponding NOS Code TEL/N4123 TEL/N4124</p>	<ul style="list-style-type: none"> • Imparting the basic principles and its related functions, settings, specifications etc. • Understand relevance of various indicative lights on the Wi-Fi Backhaul and Access Point eqpt. • Learning trouble shooting, preventive maintenance, check List, • Understand Cables used, Feeder cable Connectors and technical measurements related to faults between Cable and connectors. • Understand settings of Wi-Fi Backhaul Eqpt, Access Points Eqpt. • Understand how to Localize fault between Wi-Fi backhaul and access point eqpt as well as up to service provider gateway. • Understand how to test the speed of broadband connection and to demonstrate the same to the customer. 	
4	<p>UPS installation & domestic power supply checks.</p> <p>Theory Duration (hh:mm) 20 :00</p> <p>Practical Duration (hh:mm) 20:00</p> <p>Corresponding NOS Code TEL/N4122 TEL/N4125</p>	<ul style="list-style-type: none"> • Training on electrical Checks, AC/DC Distributions, Earthing, LA & AL, DTS, CPH Guideline, Cell to TOC, External alarm at Site and OSS • Training on Earthing & Continuity check. • Training on load calculations, routing of power supply through UPS, battery back up requirements. • Learning the working of UPS, Electrical systems • Documenting monitor readings, check lists, faults, reports on changes and movements. 	Tester, multi meter and electrical tools, Megger

<p>5</p>	<p>Health, Safety, and Maintenance</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 20:00</p> <p>Corresponding NOS Code TEL/N4122 TEL/N4123 TEL/N4124 TEL/N4125</p>	<ul style="list-style-type: none"> • Educating general safety rules and health check for site, alarms • Making the candidate understand personal protective equipment like safety Harness, helmet, gloves, eye protection glass, earplugs, nose mask etc. and their application under different working conditions • Training on various safety procedures and methods like barricading of work place, signage, safety drills, evacuation Procedures etc. • Acquiring knowledge of Pole / Tower, Antenna Fixing, Pole / Tower climbing. • Understanding the importance of fault identification & early rectification. • Training for effective maintenance 	<p>Helmets, safety harness and gloves, eye protecting glass, earplugs. Fire safety devices (Fire Extinguisher (Electrical, General, Oil Fire)</p>
	<p>Total Duration</p> <p>Theory Duration 150:00</p> <p>Practical Duration 150:00</p>	<ul style="list-style-type: none"> • Unique Equipment Required: Projector, black board and whiteboard, laptop / PC, Test & Measuring instruments like Cable & Antenna Tester, Handheld Network Tester, Wi-Fi Backhaul equipment, Access Points, UPS & Battery set. 	

Grand Total Course Duration: **300Hours, 0 Minutes**

(This syllabus/ curriculum has been approved by [Telecom Sector Skill Council](#))

Trainer Prerequisites for Job role: “Telecom - Wireless Technician” mapped to Qualification Pack: “TEL/N4105, v1.0”

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “ <u>TEL/Q4105</u> , Version No. 1.0.”
2	Personal Attributes	This job requires the individual to be technically qualified; self-disciplined; assertive; team player; action-orientated; possess analytical skills & problem solving ability; effective communication skills and ability to work under pressure.
3	Minimum Educational Qualifications	Preferably equivalent to Diploma
4a	Domain Certification	Certified for Job Role: “ <u>Telecom – Wireless Technician</u> ” mapped to QP: “ <u>TEL/4105</u> , Version No. 1.0.” Minimum accepted score as per respective TSSC guidelines.
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “ <u>TEL/4105</u> , Version No. 1.0” Minimum accepted score as per respective TSSC guidelines.
5	Experience	<ul style="list-style-type: none"> • The trainer should be certified by TSSC as ‘Train the Trainer’ and Assessor and • Worked as Wireless Technician for a minimum of 3-4 years if educational qualification is ITI/Diploma or • Worked as Telecom –Wireless Technician for 1-2 years if educational qualification is Bachelor in Technology (B.Tech. and BE.)

Annexure: Assessment Criteria

Criteria for Assessment of Trainee					
Job Role : Wireless Technician Qualification Pack : TEL/Q4105 Sector Skill Council : Telecom Sector Skill Council					
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. Individual assessment agencies will create unique question papers for theory and skill practical part for each candidate at each examination/training center. 4. To pass the Qualification Pack, every trainee should score a minimum 70% in every NOS. 6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.					
Assessable Outcome	Assessment Criteria	Total Mark (400)	Out Of	Theory	Skills Practical
TEL/N4122 Prepare the wiring & equipment installation of WiFi Backhaul Equipment (5 GHz), Antenna and WiFi Access Points (2.4 GHz).	PC1. arrange access to sites according to required procedure.	100	6	3	3
	PC2. organize tools, equipment and materials for a given work.		6	3	3
	PC3. match cable type including feeder cable and connectors to installation environment and different site requirements as per plan.		6	3	3
	PC4. check cable length for continuity		6	3	3
	PC5. verify cable route is free of electrical hazards and obstructions both outdoor and indoors.		6	3	3
	PC6. verify that the cable running length is free from obstruction for connecting the eqpt with antenna at different sites.		5	3	2
	PC7. select suitable location for equipment installation at different sites w.r.t location of Mast / Tower & Power Point etc		5	3	2
Undertake wiring and Install system hardware cable route from PoP to WiFiEqpt sites, Access Points.	PC8. ensured structured wiring from PoP to different sites.	100	6	3	3
	PC9. ensure neat wiring and clipping at all points up to the eqpt at each site.		6	3	3
	PC10. ensure proper cable termination and use of appropriate connectors.		5	3	2
	PC11. ensure proper feeder cable termination between Eqpt and Antenna.		5	3	2
	PC12. test the cable & joints for transmission loss and strength. Re- terminate if loss exceeds prescribed limits.		6	3	2
	PC13. install equipment following electrical safety principals and manufacturer's instructions.		6	3	3
	PC14. power-up the system ensuring proper earthing arrangement		6	3	3
Clean up worksite and complete documentation	PC15. removal and proper dispose of installation waste	100	5	3	2
	PC16. restore worksite to customer's satisfaction		5	3	2
	PC17. update plans and records with details of installation and test results.		5	3	2

	PC18. complete all installation documents		5	3	2
Total			100	54	46
TEL/N4123 Configuration of WiFiBackhaul Equipment (5 GHz), WiFi Access Points (2.4 GHz) at different sites.	PC1. connect up Feeder Cable with Antenna at different sites and measure VSWR / Return loss.		6	3	3
	PC2. connect WiFiBackhaul Eqpt with feeder cable and check Antenna orientation to get surveyed receive levels.		6	3	3
	PC3. connect WiFiBackhaul Eqpt with WiFiAccess Points.		6	3	3
	PC4 connect up laptop/PC, and other appropriate device to the interface eqpt		6	3	3
	PC5. access setting using default login credentials		6	3	3
	PC6. configure as per the base setting (IP, Gateway, Mask etc.)		8	3	5
Establishing connectivity with the service provider gateway.	PC7. ensure all cables/connectors are correctly plugged in		6	3	3
	PC8. ping service provider gateway		6	3	3
	PC9. analyze test results for connectivity and throughput parameters		8	3	5
Establishing connectivity between WiFi Backhaul Eqpt and WiFi Access Points and End user devices.	PC10. configure end user device to establish connectivity with the WiFi Access Point.		6	3	3
	PC11. Ping WiFi access point from end user device and analyze response.	100	6	3	3
Record configuration setting and testing steps.	PC 12. record WiFi Backhaul Equipment (5 GHz) configuration settings & test results at all sites.		6	3	3
	PC 13. record WiFi Access Equipment (2.4 GHz) configuration settings & test results at all sites.		6	3	3
	PC14. record end user device configuration setting		6	3	3
	PC15. record pinging procedure and expected result parameters		6	3	3
	PC16. brief customer on basic trouble-shooting steps/self-help		6	3	3
Total			100	48	52
TEL/N4124 Locate and troubleshoot cable and connector fault	PC1. differentiate between types of cables		5	3	2
	PC2. Identify correct cable pairs		5	3	2
	PC3. Undertake continuity check and localize fault distance		5	3	2
Troubleshoot WiFi backhaul Equipment (5 GHz)	PC4. understand relevance of various indicative lights on the WiFi Backhaul Equipment.		5	3	2
	PC5. connect Handheld Network Tester portable device for fault diagnostic.		5	3	2
	PC6. connect Cable & Antenna tester if required.		5	3	2
	PC7. check for Antenna orientation if required.		5	3	2
	PC8. decipher results to localize fault.		6	3	3
Troubleshoot WiFi Access Points (2.4 Hz)	PC9. understand relevance of various indicative lights on the WiFi Access Points Equipment.	100	5	3	2
	PC10. connect Handheld Network Tester portable device for fault diagnostic.		5	3	2
	PC11. decipher results to localize fault.		6	3	3
	PC12. access WiFi Access Point through browser/software application and run diagnostic application.		6	3	3
Rectify the faults with cable,connectors, backhaul equipments at service provider gateway,	PC13. carry out re-conectorization/crimping (of cable pairs with connector) or replace cable, if required		5	3	2
	PC14. replace feeder cable / antenna, if required.		5	3	2
	PC15. re-configure the WiFi Backhaul Eqpt to correct		6	3	3

access point and end user devices	settings, if required.				
	PC16. reset WiFi Access points, if required.		6	3	3
Complete documentation and clean-up, worksite	PC17. record steps undertaken for fault localization/isolation		5	3	2
	PC18. record changes undertaken for fault rectification		5	3	2
	PC19. Restore any changes made to the worksite during fault repair to the client's satisfaction.		5	3	2
			100	57	43
TEL/N4125 Installation of UPS and checking the electrical parameters.	PC1. carry out voltage, current checks	100	5	0	5
	PC2. carry out earthing checks		10	4	6
	PC3. installation of UPS		20	5	15
	PC4. routing of power supply through UPS		10	4	6
	PC5. calculate equipment load vis-à-vis UPS rating		20	15	5
	PC6. exercise precautions whilst handling power supplies		20	10	10
	PC7. UPS battery checks & replacement		15	10	5
Total			100	48	52
Grand Total			400	207	193