

Model Curriculum

Drive Test Engineer

SECTOR: TELECOM
SUB-SECTOR: NETWORK MANAGED SERVICES
OCCUPATION: NETWORK OPERATION & MAINTENANCE
REF ID: TEL/Q6211, V1.0
NSQF LEVEL: 5



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

TELECOM SECTOR SKILL COUNCIL

for

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: 'Drive Test Engineer'
QP No. 'TEL/Q6211 NSQF Level 5'

Date of Issuance: **Nov 10th, 2017**

Valid up to*: **Nov 10th, 2021**

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



Authorised Signatory
(Telecom Sector Skill Council)

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Drive Test Engineer

CURRICULUM / SYLLABUS

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

Program Name	Drive Test Engineer		
Qualification Pack Name & Reference ID.	TEL/Q6211, v1.0		
Version No.	1.0	Version Update Date	10-11-2017
Pre-requisites to Training	ITI/Diploma		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Inspect tower site and prepare for drive test: verify the site on various parameters and arrange tools/equipment for audit activity at tower site. • Measure tower site performance and parameter recording: plan and coordinate with site in-charge to perform drive test activity. Trace real-time performance of the site and identify the fault (if any) on the site and rectify it. • Analyse tower site data and report: analyse the report on drive test and prepare the report as per the client/company requirement and take appropriate action. • Optimise tower site and troubleshoot: optimise the site and perform troubleshooting based on the report. • Follow health and safety: Follow basic health and safety norms and understand the organisation procedures. 		

This course encompasses 5 out of 5 National Occupational Standards (NOS) of ‘Drive Test Engineer’ Qualification Pack issued by “TSSC: Telecom Skill Council of India”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Introduction to telecommunication</p> <p>Theory Duration (hh:mm) 40:00</p> <p>Practical Duration (hh:mm) 00:00</p> <p>Corresponding</p> <p>NOS Code NA</p>	<ul style="list-style-type: none"> Summarize the history of telecom sector evolution Distinguish the various segments of telecom sector i.e. passive infra and active networks Categorise different technologies based on architecture - 2G GSM, 3G, 4G/VoLTE network Illustrate the spectrum usage in telecom sector Make use of knowledge on AMT (Amplifier Mount Trans receiver) Demonstrate the importance of various active and passive components /equipment Classify the various logic channels in the active networks Explain the call flow process in 2G, 3G and 4G 	NA
2	<p>Tower site verification and preparation for drive test</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 35:00</p> <p>Corresponding NOS Code TEL/N6237</p>	<ul style="list-style-type: none"> Distinguish the passive network components/equipment – DG, SMPS, PIU, Battery bank, shelter, Air conditioner, roster, internal and external earthing at the site, feeder and jumper cable. Categorise tower types - GBT (Ground Base Tower), RTT (Roof Top Tower), COW (Coverage on wheel) and RTP (Roof Top Pole) Verify the tower ID, cell ID, antenna height and tilt (electrical and mechanical), sector swap, antenna orientation/azimuth. Demonstrate the use of various equipment/tools to measure/perform during the site audit. 	GPS (Global Positioning Satellite), Binocular, magnetic compass, camera, measuring tape (50meter), antenna alignment tools
3	<p>Tower site performance measurement and parameter recording</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 55:00</p> <p>Corresponding NOS Code TEL/N6238</p>	<ul style="list-style-type: none"> Classify the active network equipment – BTS (Base Trans receiver Station), microwave propagation, IF cable and different types of GSM & microwave antenna Outline the drive test path of the site Perform clock-wise and anti-clock wise handover drive Check the feeder cable swap Construct log files for dropped calls, blocked calls, handover failures, TA and inter-connectivity between GSM/ UMTS/ LTE/ VoLTE Perform a benchmark/cluster/data /handover drive test 	Laptop with TEMS Software or compatible software, data card, magnetic GPS/Gramin 72, a handset (e.g. Sony W995) compatible with software (MapInfo, Google Map)

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> • Create log files for short calls and long calls separately • Identify the faults and rectify it • Escalate the issues (if required) and report accordingly 	
4	<p>Tower site data analysis and reporting</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 35:00</p> <p>Corresponding NOS Code TEL/N6239</p>	<ul style="list-style-type: none"> • Examine the 2G parameters – Rx level, Rx Quality, C/I, SQI, UL/DL throughput • Examine the 3G parameters – RSCP, EC/No, RSSI, SC, CQI, UL/DL throughput • Examine the 4G/VoLTE parameters – RSRP, RSRQ, PCI, SINR, UL/DL throughput, MO/MT, AT/DT, ping testing • Examine parameters common to 2G/3G/4G – coverage, neighbour site handover, call drop, KPI analysis • List the record of faults on sites visited and rectify the related issues • Generate performance report covering – vector map, cell site details, export of log files 	Laptop with TEMS Software/ other compatible Software, Dongle and MapInfo
5	<p>Tower Site Optimization and troubleshooting</p> <p>Theory Duration (hh:mm) 10:00</p> <p>Practical Duration (hh:mm) 35:00</p> <p>Corresponding NOS Code TEL/N6240</p>	<ul style="list-style-type: none"> • Examine the site optimisation parameters at antenna end – azimuths, antenna tilts (E/M), antenna height and orientation • Compare and change (if required) certain parameters from NOC – Broadcast channel, Traffic channel number, cell ID, time slot etc. • Optimise the cells cluster-wise • Implement corrective actions based on cell parameters 	Laptop with TEMS Software/ other compatible Software, Dongle and MapInfo
6	<p>Health & Safety</p> <p>Theory Duration (hh:mm) 5:00</p> <p>Practical Duration (hh:mm) 10:00</p> <p>Corresponding NOS Code TEL/N2509</p>	<ul style="list-style-type: none"> • Classify different safety equipment • Plan and set up for safety kits and concerned personnel • Summarise the cause of accidents and hazards • Outline the importance of safe working practices and general health concerns • Report escalation procedure for safety hazards • Implement work safety at different work places • Categorise different types of fire-resistant equipment • List the electrical safety guidelines 	Personal Protective Equipment (safety belt, safety gloves, helmet, high-visibility clothes etc.)

Sr. No.	Module	Key Learning Outcomes	Equipment Required
7	Soft Skills Theory Duration (hh:mm) 5:00 Practical Duration (hh:mm) 10:00 Corresponding NOS Code NA	<ul style="list-style-type: none"> Outline and explain grooming guidelines with respect to a drive test engineer Understand the importance of grooming Demonstrate effective process of communication at your work place Demonstrate different types of communication and effective listening skills in your day-to-day life Implement effective time management techniques Identify frivolous member from team 	NA
	Total Duration Theory Duration 120:00 Practical Duration 180:00	Unique Equipment Required: Laptop/PC, white board, marker, projector, first-aid kit, GPS system, Binoculars, magnetic compass, camera, measuring tape (50 meter), antenna alignment tools, laptop with TEMS Software or compatible software, data card, magnetic GPS/Gramin 72, a handset (e.g. Sony W995) compatible with software (MapInfo, Google Map), Personal Protective Equipment (safety belt, safety gloves, helmet, high-visibility clothes etc.)	

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

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

Trainer Prerequisites for Job role: “Drive Test Engineer” mapped to Qualification Pack: “TEL/Q6211, v1.0”

Sr. No.	Area	Details
1	Description	Drive Test engineer is responsible for checking the network performance of the cell site by measuring the parameters using fixed/ portable test/ measuring equipment
2	Personal Attributes	This job requires a person who is having willingness of doing field job and having good patience level, dedicated towards goal, technically qualified, team player, action oriented. He should be able to analyse, interpret data and apply professional judgement to carry out assigned responsibilities.
3	Minimum Educational Qualifications	ITI/Diploma
4a	Domain Certification	Certified for Job Role: “Drive Test Engineer” mapped to QP: “TEL/Q6211”, Version No. 1.0 Minimum accepted score should be mentioned as 80%.
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “MEP/Q0102”, Version No. 1.0 Minimum accepted score as per SSC guidelines is 80%.
5	Experience	<ul style="list-style-type: none"> The trainer should be certified by TSSC as ‘Train the Trainer’ and ‘Assessor’ Worked on active networks and passive networks for at least one year

Annexure: Assessment Criteria

Assessment Criteria	
Job Role	Drive Test Engineer
Qualification Pack	TEL/Q6211, V. 1.0
Sector Skill Council	Telecom

Sr. No.	Guidelines for Assessment
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
4	Individual assessment agencies will create unique question papers for theory and skill practical part for each candidate at each examination/ training center
5	To pass the Qualification Pack, every trainee should score a minimum 70% of aggregate marks to successfully clear the assessment
6	In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

Compulsory NOS				Marks Allocation	
Assessment Outcome	Assessment Criteria	Total Marks	Total Marks: 500		
			Out Of	Theory	Skills Practical
TEL/N6237 Tower site verification and preparation for drive test	PC1. verify tower ID (all three sectors) and latitude & longitude of the site	100	10	5	5
	PC2. ascertain antenna height, antenna tilt (E/M) and antenna orientation of the site as per the given parameters		20	10	10
	PC3. ascertain sector swap as per the defined parameters		10	4	6
	PC4. perform EMF survey as per the company norms		5	0	5
	PC5. ascertain availability of all test and measuring equipment (magnetic compass, hand GPS, tilt meter, digital camera, safety kit and measuring tape)		20	10	10
	PC6. ascertain availability of all tools for performing drive test (laptop, charger, portable charges, data cables, TEMS dongle, mobile phone)		25	10	15
	PC7. ascertain availability and proper installation configuration of drive test measurement and recording software (TEMS, MAPINFO, MCOM)		10	5	5
	TOTAL		100	44	56
TEL/N6238 Tower site performance measurement and parameter recording	PC1. trace a given path on the google earth software, mapinfo to identify the site locations	100	5	0	5
	PC2. co-ordinate with the support teams for scheduling the drive test		5	0	5
	PC3. plan the drive test route		10	4	6
	PC4. check/rectify the fault, site alarm (if any) before performing the drive test.		20	5	15
	PC5. demonstrate test compliances (no swap in the sector, all neighboring cells parameters are defined, and all RF frequencies given are correct as per company norms)		15	7	8
	PC6. demonstrate recording of drive test log (dropped calls, blocked calls, handover failures, TA, clock-wise, anti -clockwise handover and inter-connectivity between GSM/ UMTS/ LTE/ VoLTE)		10	5	5

	PC7. undertake basic analysis of the report generated by Layer 2 and 3 during the drive test/ post drive test		10	4	6
	PC8. demonstrate the process of creating log files (short call and long call per sector of a site)		5	0	5
	PC9. recheck the log files before leaving the site		5	2	3
	PC10. identify the nature of fault (due to active or passive components at the tower site)		5	5	0
	PC11. coordinate with infra engineer/ technicians for rectification and cater overall site performance		5	5	0
	PC12. undertake/ coordinate root cause analysis (with backend team) is done for dropped/ blocked calls/ handover failure		5	5	0
	TOTAL		100	42	58
TEL/N6239 Tower site data analysis and reporting	PC1. demonstrate and analyse all the parameters related to 2G drive test (Rx level, Rx quality, C/I, SQI, UL/DL throughput)	100	20	5	15
	PC2. demonstrate and analyse all the parameters related to 3G drive test (RSCP, EC/No, RSSI, SC, CQI, UL/DL throughput)		15	5	10
	PC3. demonstrate and analyse all the parameters related to 4G/VoLTE drive test (RSRP, RSRQ, PCI, SINR, UL/DL throughput, MO/MT, AT/DT, ping testing)		15	5	10
	PC4. analyse key site parameters (coverage analysis, overshooting analysis, pollution analysis, neighbouring site analysis, call drop analysis, delay analysis, and network KPI analysis)		20	5	15
	PC5. record faults and take corrective actions		10	5	5
	PC6. filling all the required details in drive test report template		10	5	5
	PC7. generate performance report (covering vector map, cell site details, export of recorded log files)		10	5	5
	TOTAL		100	35	65
TEL/N6240 Tower site optimisation and troubleshooting	PC1. co-ordinate with the helper for site antenna adjustment (azimuths, antenna tilts (E/M), antenna height and orientation)	100	20	10	10
	PC2. undertake parameter checks (BTS, NodeB, eNodeB, transmit power, feature algorithms, frequency hopping)		30	10	20
	PC3. capture GPS direction and latitude/ longitude of any immediate obstructions (tall building, chimney, water tank etc)		20	10	10

	PC4. identify the swap and know how to prepare connectors		20	5	15
	PC5. troubleshoot/ undertake corrective actions (based on analysis of the local site parameters)		10	4	6
	TOTAL		100	39	61
TEL/N2509 Health & Safety	PC1. ensure that work is carried out in accordance with the laid down safety, security policies and procedures of the organization	100	10	6	4
	PC2. ensure that site is assessed for safety and emergency readiness compliance as per company's guidelines		12	6	6
	PC3. ensure electrical safety compliances and EMI/EMC hygiene requirements are met as per the guidelines		15	9	6
	PC4. identify and correct any hazards that you can deal with safely, competently and within the limits of your authority		15	10	5
	PC5. report any hazards that you are not competent to deal with to the relevant person in line with organizational procedures and warn other people who may be affected		12	7	5
	PC6. follow your organisations's emergency procedures promptly, calmly and efficiently		12	6	6
	PC7. identify and recommend opportunities for improving health, safety, security to the designated person		14	8	6
	PC8. complete any health and safety records legibly and accurately		10	5	5
	Total		100	57	43