

*Syllabi of Courses*  
*for*  
*Skill Development in ESDM sector*

*Under the “Scheme for Financial assistance to select seven (07) States/ UTs for Skill Development in ESDM sector”*

*of*

**Department of Electronics and Information Technology**  
*Ministry of Communications & Information Technology,  
Government of India*

**Submitted by**

**TELECOM SECTOR SKILLS COUNCIL**

VERSION:2.2

Dated: 22<sup>nd</sup> January 2015

## ESDM Courses (Broadband Technician)

**Level Code:**  **Vertical Name:**

**Course Code:**  **Course Name:**

### Objective of the Course:

The person is responsible for installation, configuration and testing of CPE (modem, routers, and Switches) for broadband access. He also establishes connectivity between CPE and end-user device (CPU, Laptop, tablets, Smart/IP TV etc.) at customer premises and carries out basic trouble-shooting for identifying, localizing & rectifying cable, connectivity and equipment fault in coordination with NOC.

### Learning Outcomes:

By the end of the training, the person should be able to perform the following activities:

#### **TEL/N0111 (Cable/system wiring and equipment installation at customer premises)**

1. arrange access to site according to required procedure
2. organize tools, equipment and materials for a given work
3. match cable type and connectors to installation environment and customer requirements
4. check cable length for continuity
5. verify cable route is free of electrical hazards and obstructions both outdoors and indoors
6. verify that the cable running length is within the permissible limit to ensure designed throughput
7. select suitable location for equipment installation wrt power point and signal coverage
8. ensure structured wiring from PoP to Customer premise JB
9. ensure neat wiring and clipping within customer premise
10. ensure proper cable termination and use of appropriate connectors
11. Test the cable & joints for transmission loss and strength. Re-terminate if loss exceeds prescribed limits
12. install equipment following electrical safety principals and manufacturer's instructions
13. power-up the system ensuring proper earthing arrangement
14. removal and proper dispose of installation waste
15. restore worksite to customer's satisfaction
16. update plans and records with details of installation and test results
17. complete all installation documents and customer signoff

#### **TEL/N0112 (Configuration of equipment and establishing Broadband connectivity)**

1. connect up laptop/PC, Smart/IP TV and other appropriate device to the CPE (modem, router, switch) and establish connectivity
2. access CPE setting using default login credentials
3. Configure CPE as per the base setting (IP, Gateway, Mask etc.)
4. ensure all cables/connectors are correctly plugged in
5. ping service provider gateway
6. analyse test results for connectivity and throughput parameters

7. configure end user device to establish LAN connectivity with the CPE
8. ping CPE from end user device and analyze response
9. record CPE configuration settings
10. record end user device configuration setting
11. record pinging procedure and expected result parameters
12. brief customer on basic trouble-shooting steps/self-help

**TEL/N0113 (Trouble-shoot to localize and rectify faults)**

1. Differentiate between types of cables
2. Identify correct cable pairs
3. Undertake continuity check and localize fault distance
4. Understand relevance of various indicative lights on the CPE
5. Connect CPE to laptop/CPU/portable device for fault diagnostic
6. Install CPE access software, if required
7. Access CPE through browser/software application and run diagnostic application
8. decipher results to localize fault
9. Carry out re-connectorization/crimping (of cable pairs with connector) or replace cable, if required
10. re-configure the CPE to correct settings
11. Reset CPE, if required.
12. Record steps undertaken for fault localization/isolation
13. Record changes undertaken for fault rectification
14. Restore any changes made to the worksite during fault repair to the client's satisfaction

**TEL/N0114 (UPS installation & Domestic Power Supply checks)**

1. Arrange access to site according to required procedure
2. Organize tools, equipment and materials for a given work
3. Match cable type and connectors to installation environment and customer requirements
4. Check cable length for continuity
5. Verify cable route is free of electrical hazards and obstructions both outdoors and indoors
6. Verify that the cable running length is within the permissible limit to ensure designed throughput
7. Select suitable location for equipment installation wrt power point and signal Coverage
8. Ensure structured wiring from PoP to Customer premise JB
9. Ensure neat wiring and clipping within customer premise
10. Ensure proper cable termination and use of appropriate connectors
11. Test the cable & joints for transmission loss and strength. Re-terminate if loss exceeds prescribed limits
12. Install equipment following electrical safety principals and manufacturer's instructions
13. Power-up the system ensuring proper earthing arrangement
14. Removal and proper dispose of installation waste
15. Restore worksite to customer's satisfaction
16. Update plans and records with details of installation and test results
17. Complete all installation documents and customer signoff

**Expected Job Roles:**

|                      |
|----------------------|
| Broadband Technician |
|----------------------|

**Duration of the Course (in hours)**

|                   |
|-------------------|
| 350 Hours approx. |
|-------------------|

**Minimum Eligibility Criteria and pre-requisites, if any**

|                  |
|------------------|
| 10+2/ITI/Diploma |
|------------------|

**Professional Knowledge:**

|   |
|---|
| <p>Knowledge of Customer Premise Equipment (CPE), Cable Laying, Connectorisation, structured cabling norms<br/>         Basic concepts of Network topologies, TCP/IP, Broadband Network Elements, Gateways, IP Address, Subnet masks, Ethernet and MAC Address, IPv4, IPv6<br/>         Identification of cables and cable pairs and their maintenance<br/>         Basic knowledge of EMI / EMC<br/>         Basic knowledge of UPS and its handling</p> |
|---|

**Professional Skill:**

|   |
|---|
| <p>Equipment installation/Task Management Skills<br/>         Technical interpretation<br/>         Equipment Configuration / Operating Skills<br/>         Problem solving skills<br/>         Analytical Skills<br/>         Planning and Execution</p> |
|---|

**Core Skill:**

|  |
|--|
| <p>Basic Reading &amp; Writing Skills<br/>         Communication Skills<br/>         Reading Skills<br/>         Oral communication Skills</p> |
|--|

**Detailed Syllabus of Course**

| Module No. | Module name and content                          | Number of hours  |
|------------|--|------------------|
| 1.         | As per the NOSs listed in the Qualification pack |                  |
|            |  |                  |
|            | <b>Total Theory/Lecture Hours</b>                | <b>150 Hours</b> |
|            | <b>Total Practical/ Tutorial Hours</b>           | <b>200 Hours</b> |
|            | <b>Total Hours</b>                               | <b>350 Hours</b> |

**Recommended Hardware:**

Customer Premise Equipment (CPE- Modem, Router, Switches) wireless router, Wirings (Co-axial, Fiber, UTP, STP,CU), Junction Box, connectors including RJ 45, Splitter, Crimping Tools, Splicing Tools like Optical Fibre Splicer with accessories, OTDR, Optical Fibre Cable, Power meter, patch cords,Wiring installation tools and test equipment

**Recommended Software:**

OEM Software installed as part of CPE, MS Office for Managing reports

**Text Books:**

Training material for students aligned with TSSC QP by affiliated training partners.

**Reference Books:**

NA

## TSSC - ESDM Courses (Tower Technician)

|                     |           |                       |                                  |
|---------------------|-----------|-----------------------|----------------------------------|
| <b>Level Code:</b>  | 4         | <b>Vertical Name:</b> | Telecom (Passive Infrastructure) |
| <b>Course Code:</b> | TEL/Q4100 | <b>Course Name:</b>   | Tower Technician                 |

### Objective of the Course:

The person should be able to maintain tower sites which are live 24x7, maintain and repair level-1 faults/issues at telecom tower site, undertake preventive and corrective maintenance of the site equipment (Generator, Battery Banks, ACs, and SMPS) and analyse & report/escalate faults.

### Learning Outcomes:

By the end of the training, the person should be able to perform the following activities:

#### **TEL/N4100 (Site hygiene)**

1. Maintain site hygiene of AC, DG, PIU, SMPS and battery bank, as per organization's norms
2. Check leakage, rattles and shakes at the tower site
3. Check if installation of fire safety instruments is in place
4. Control fire accident incidents
5. Check the site as per electrical safety norms
6. Check proper floor markings, shadow board display and labels
7. Check diesel consumption and highlight excessive consumption to supervisor
8. Conduct work area audit as per company checklists
9. Maintain checklist of standards laid by the company

#### **TEL/N4101 (Preventive Maintenance)**

1. Adhere to PM (preventive maintenance) plan
2. Comply with Beat plan execution, for self
3. Conduct site PM (preventive maintenance)
4. Keep a check on site up-time
5. Perform unique site down PM (preventive maintenance)
6. Perform health check on site like checking engine oil, voltage etc.
7. Check premature ageing of Battery Bank, Diesel Generator, Air Conditioner, PIU and SMPS
8. Monitor outages due to Diesel Generator
9. Close maximum number of complaints registered
10. Provide timely resolutions to trouble tickets raised
11. Comply with preventive maintenance schedule

#### **TEL/N4102 (Site Management)**

1. Monitor reading as per EB (electricity bill) against reading on PIU (power interface unit)
2. Timely collect and submit the EB (electricity bill) at the office

3. Check number of alarms active at the site
4. Check site for faulty alarms
5. Attend alarms within the defined SLA
6. Identify the reasons for site lock
7. Co-ordinate with service providers for quality fuel to be filled
8. Interact with site owners w.r.t. rent, access issues etc.

**TEL/N4103 (Task reporting)**

1. Escalate faults/issues at site to supervisor
2. Fill the preventive maintenance checklists/reports
3. Fill the corrective maintenance checklists/reports
4. Accurately report diesel filling, electricity bill and DG reading
5. Report any changes in the site or movement of any material
6. Report theft if any from the site location
7. Report movement of tower technicians to supervisor

**Expected Job Roles:**

Tower Technician

**Duration of the Course  
(in hours)**

350 Hours

**Minimum Eligibility  
Criteria and pre-  
requisites, if any**

10+2 and/or ITI or Diploma in Electrical/Mechanical

**Professional Knowledge:**

Functional knowledge of all site equipment, system components, special tools & equipments used for system repairs

**Professional Skill:**

Planning and Execution  
Relationship Building  
Analytical Skills  
Technical Skills

**Core Skill:**

|   |
|---|
| Comprehension Skills<br>Reading Skills<br>Oral Communication Skills |
|---|

**Detailed Syllabus Overview**

| Module. No                               | Module. Name                                     | Minimum No. of Hours |
|--|--|----------------------|
| 1  | As per the NOSs listed in the Qualification pack |                      |
| <b>Total Theory / Lecture Hours:</b>     |  | 200                  |
| <b>Total Practical / Tutorial Hours:</b> |  | 150                  |
| <b>Total Hours:</b>                      |  | 350                  |

**Recommended Hardware:**

|  |
|--|
| D G Set, Air Conditioner, Power Interface Unit (PIU), SMPS, Battery bank, Electrical wiremen hand tools, screwdriver set, Multimeter |
|--|

**Recommended Software:**

|                         |
|-------------------------|
| MS Office for reporting |
|-------------------------|

**Text Books:**

|  |
|--|
| Training material for students aligned with TSSC QP by affiliated training partners. |
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**Reference Books:**

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| NA |
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## TSSC - ESDM Courses (Handset Repair Engineer-Level II)

|                     |           |                       |                                    |
|---------------------|-----------|-----------------------|------------------------------------|
| <b>Level Code:</b>  | 4         | <b>Vertical Name:</b> | Telecom (Handset)                  |
| <b>Course Code:</b> | TEL/Q2201 | <b>Course Name:</b>   | Handset repair Engineer (Level II) |

### Objective of the Course:

The person should be able to perform handset / tablet repair including hardware and software components and testing the handset for adequacy post repair. To develop skills that allow an individual to be responsible for performing handset repair including hardware and software components and testing the handset for adequacy post repair.

This engineer will have a working knowledge of the following:

1. Repair, configuration, assembly and testing of mobile phone handsets.
2. Carry out trouble shooting for a vast range of mobile phone handsets.

### Learning Outcomes:

By end of the training, the person should be able to perform the following activities:

#### **TEL/N2203 (Perform handset repair- hardware)**

1. Ensure faulty handsets are received from the customer facing team
2. Obtain/ note fault details as mentioned by the customer facing team and other handset specifications
3. Obtain the committed repair timelines (SLAs)
4. Prioritize repair activities as per guidelines
5. Ensure clean, neat, dust free and organized working environment
6. Determine components required based on fault diagnosis
7. Obtain materials required( such as components, equipments, testing devices and other inventory) as per organizational procedures
8. Ensure that tools, equipments and testing devices are in proper working condition and calibrated
9. Ensure compliance with lead free soldering techniques
10. Refer the company (handset manufacturer) specific technical database to identify root cause of handset fault and to determine rectification options
11. Isolate the cause of fault by conducting appropriate diagnostic test, in case details are not available
12. Determine the options to rectify the fault and confirm with supervisors, if required
13. Dismantle handset/components as per organizational guidelines/procedures
14. Ensure rectification of handset fault within the SLAs
15. Ensure timely escalation of emergency/ unresolved issues according to established procedures
16. Ensure all repairs conform to the quality targets in terms of bounce and repeat repair percentages,first time fix etc
17. Assess test equipments are appropriately calibrated

18. Confirm effectiveness of the repair process, by utilizing appropriate test equipments as per standard test processes
19. Ensure that fault has been rectified without any collateral damage to handset
20. Handover repaired handset to appropriate authority
21. Ensure completion of administrative jobs like site clearance, return of test equipments
22. pass through ESD test before entering the facility
23. Ensure that protection equipments like ESD equipments, anti-static bands, clothes and gloves are appropriately used as required
24. Ensure compliance with site risk control, OHS, environmental and quality requirements as per company's norms
25. Ensure escalation of safety incidents to relevant authorities as per guidelines
26. Ensure that handset inventory in hand for repairs is tracked and accounted for appropriately as per company procedures
27. Ensure record sheets are completed accurately, as per company guidelines
28. Ensure all relevant parties (including supervisors, customer teams) are notified of the completion of repair activity
29. Retain documents for specific period of time, as per company procedure

**TEL/N2204 (Perform handset repair- software)**

1. Ensure faulty handsets are received from customer facing team
2. Obtain/ note fault details as mentioned by the customer facing team and other handset specifications
3. Obtain the committed repair timelines (SLAs)
4. Prioritize repair activities as per guidelines
5. undertake fault diagnosis on software components
6. Interpret results and isolate fault
7. Estimate repair timelines
8. Refer the company (handset manufacturer) specific technical database for optimal rectification options
9. Check availability of correct software versions/modules
10. Ensure clean, dust free and organized working environment
11. Ensure availability of connectors/cables
12. Obtain and ensure all tools are available and diagnostic equipment operational
13. Obtain software required as per organizational procedures
14. Ensure that the software versions are current and ready to use
15. Carry out necessary software fault rectification ( correction/Upgradation, software replacement)
16. Ensure rectification of handset fault within the SLAs
17. Check handset performance to ascertain fault has been rectified
18. Ensure timely escalation of emergency/ unresolved issues according to established procedures
19. ensure all repairs conform to the quality targets
20. Confirm effectiveness of the repair process, by testing the handset utilizing appropriate software jigs and standard test processes
21. Take appropriate action to rectify any deficiencies post testing
22. Ensure that fault has been rectified without any consequential damage
23. Handover repaired handset to QA team
24. Ensure completion of administrative jobs like site clearance, return of test equipments
25. Pass through ESD test before entering the facility
26. Ensure that protection equipments like anti-static bands, clothes and gloves are appropriately used as required
27. Ensure compliance with site risk control, OHS, environmental and quality requirements as per company's norms
28. Ensure escalation of safety incidents to relevant authorities as per guidelines

- 29. Ensure that handset inventory in hand (for repairs) is tracked and accounted for appropriately
- 30. Ensure record sheets are completed accurately, as per company guidelines
- 31. Ensure all concerned (supervisors, QA team, customer teams) are notified of the completion of repair activity
- 32. Retain documents for specific period of time, as per company procedure

**Expected Job Roles:**

- Handset Repair Engineer (Level II)
- 1. Repair Engineer - Mobile phones
  - 2. Sales support executive – Mobile phones
  - 3. Customer Support Executive (Technical)– Mobile phones

**Duration of the Course (in hours)** 350 Hours

**Minimum Eligibility Criteria and pre-requisites, if any** 10+2 / ITI

**Professional Knowledge:**

Functionality / features of handset, specific operating system (OS), hardware components like chipsets, processor etc., basic knowledge of GSM / CDMA, Windows & Android OS.  
 Test equipments and Hand tools  
 Handset repairing process, procedures  
 Troubleshooting techniques (software, fault finding)  
 Software troubleshooting and Software updates  
 Tablet troubleshooting skills

**Professional Skill:**

Equipment operating Skills  
 Root Cause Analysis skills  
 Handset Repairing Skills  
 Handset/Component Handling skills  
 Troubleshooting Skills  
 Software Skills  
 Tablet Repairing Skills  
 Tablet Handling Skills

**Core Skill:**

Reading, Writing and Communication Skills  
 Time Management Skills  
 Analytical Skills  
 Interpersonal Skills  
 Oral Communication (Listening & Speaking Skills)

**Detail Course Details**

| Module No. | Module name and content                          | Minimum number of hours |
|------------|--|-------------------------|
| 1.         | As per the NOSs listed in the Qualification pack |                         |
|            |  |                         |
|            | <b>Total Theory/Lecture Hours</b>                | <b>150 Hours</b>        |
|            | <b>Total Practical/ Tutorial Hours</b>           | <b>200 Hours</b>        |
|            | <b>Total Hours</b>                               | <b>350 Hours</b>        |

**Recommended Hardware:**

Test Bench, test equipment (multimeters, frequency generators etc);  
 Setup for end-to-end diagnostics and repair, software jigs.  
 Soldering Iron and accessories, SMD Rework Station or Hot Air Blower,  
 PCB Holder, Thinner for PCB Cleaner, Jumper wire, Precision Screw  
 driver set, ESD Safe, BGA Kit, Magnifying glass, Mobile Opener, Liquid  
 Flux, Wrist Strap, PCB Holder.  
 Computer with Internet

**Recommended Software:**

Original OS for various Mobile OS like Windows, Android, Symbian, iOS,  
 Blackberry and others

**Text Books:**

Training material for students aligned with TSSC QP by affiliated training  
 partners

**Reference Books:**

NA

## TSSC - ESDM Courses (Optical Fiber Splicer)

|                     |           |                       |                                    |
|---------------------|-----------|-----------------------|------------------------------------|
| <b>Level Code:</b>  | 3         | <b>Vertical Name:</b> | Telecom (Network Managed Services) |
| <b>Course Code:</b> | TEL/Q6400 | <b>Course Name:</b>   | a. Optical Fiber Splicer           |

### Objective of the Course:

The person should be able to undertake the efficient splicing of the optical fibre cables and support in optical fibre installation including fibre joint testing.

### Learning Outcomes:

Participants successfully completing this course will:

#### **TSC/N6400 (Undertake splicing of optical fiber)**

- Have good understanding of Optical fibre communication theory and Hardware.
- Have the ability to handle Fusion Splicing Machine, Optical time domain Reflectometer (OTDR), Optical loss test set and Laser source.
- Have the ability to perform efficient splicing on optical fibres using both mechanical and fusion methods.

#### **TSC/N6401 (Installation & Commissioning of Optical fiber cables (OFC))**

- Have the ability to handle tools and spare used in splicing.
- Have the ability to find fibre breakdowns, loss on joints, cable and connectors.
- Have good understanding of cable route, trenching, Manhole, Markers, splice tray and Joint closer.
- Be able to perform preventive and corrective maintenance task on fibre link.
- Be able to understand importance of safety components and safety measures.

### Expected Job Roles:

Optical Fiber Splicer

**Duration of the Course  
(in hours)**

250 Hours

**Minimum Eligibility  
Criteria and pre-  
requisites, if any**

8<sup>th</sup>

**Professional Knowledge:**

Principle of OFC Communication  
Characteristics of OFC  
Important parameters of OFC Communication  
Optical Test Equipments  
Optical Cable Laying methods, procedures and processes

**Professional Skill:**

Equipment Operating Skills  
OFC splicing and splice testing skills  
Technical Interpretation Skills  
Problem Solving Skills

**Core Skill:**

Basic Reading and Writing Skills  
Communication Skills  
Basic Project Management Skills  
Interpretation Skills  
Interpersonal Skills

**Detail Course Outline**

| <b>Module.<br/>No</b>                    | <b>Module. Name</b>                              | <b>Minimum No. of<br/>Hours</b> |
|--|--|---------------------------------|
| 1.                                       | As per the NOSs listed in the Qualification pack |                                 |
| <b>Total Theory / Lecture Hours:</b>     |  | 100 Hours                       |
| <b>Total Practical / Tutorial Hours:</b> |  | 150 Hours                       |
| <b>Total Hours:</b>                      |  | 250 Hours                       |

**Recommended Hardware:**

Optical Fibre Splicer with all standard accessories  
Patch Cords  
Optical test equipment like OTDR, Splicing Machine, light meter and power meter, Cleaver, Isopropelne  
Various types of junction boxes

**Recommended Software:**

NIL

**Text Books:**

Training material for students aligned with TSSC QP created by affiliated Training Providers.

**Reference Books:**

NA

**TSSC - ESDM Courses  
(Optical Fibre Technician)**

**Level Code:** 4 **Vertical Name:** Telecom (Network Managed Services)

**Course Code:** TEL/Q6401 **Course Name:** b. Optical Fiber Technician

**Objective of the Course:**

The person should be able to guide/oversee 'Optical Fibre Splicer' and optical cable rollout activities and in carrying out efficient optical splicing, test its effectiveness by undertaking periodic preventive maintenance activities and ensuring effective fault management in case of fault occurrence and support installation and commissioning of optical fiber cables as per route plan.

**Learning Outcomes:**

By end of the training, the person should be able to perform the following activities:

**TEL/N6402 (Co-ordinate Installation & Commissioning of Optical fiber cables (OFC))**

1. Carry out Inspection of route plan and obtain necessary clearances
2. Arrange for tools and spares
3. Coordinate trenching, cable laying, jointing and cable blowing activities
4. Test effectiveness & close activity

**TEL/N6403 (Undertake Condition based Maintenance & Planned repair activities )**

1. Obtain maintenance schedule and patrol assigned route section
2. Carry out maintenance testing of dark/ spare OFC, equipments at points of Presence (POPs)
3. Carry out planned repairs to the OFC
4. Carry out maintenance of equipments at Points of Presence (POPs)

**TEL/N6404 (Perform corrective maintenance/ restoration of optical fault)**

1. Handling fault notifications on prompt basis
2. Fault localization and rectification

**Expected Job Roles:**

Optical Fiber Technician

**Duration of the Course  
(in hours)**

350 Hours

**Minimum Eligibility  
Criteria and pre-  
requisites, if any**

10+2

**Professional Knowledge:**

Principle of OFC Communication  
Characteristics of OFC  
Important parameters of OFC Communication  
Optical Test Equipments  
Optical Cable Laying methods, procedures and processes

**Professional Skill:**

Equipment Operating Skills  
OFC splicing and splice testing skills  
Technical Interpretation Skills  
Problem Solving Skills  
Managerial Skills

**Core Skill:**

Basic Reading and Writing Skills  
Communication Skills  
Basic Project Management Skills  
Interpretation Skills  
Interpersonal Skills

## Detail Course Outline

| Module. No | Module. Name                                     | Minimum No. of Hours |
|------------|--|----------------------|
| 1.         | As per the NOSs listed in the Qualification pack |                      |
|            |  |                      |
|            | Total Theory / Lecture Hours:                    | 130                  |
|            | Total Practical / Tutorial Hours:                | 220                  |
|            | Total Hours:                                     | 350                  |

**Recommended Hardware:**

Optical Fibre Splicer with all standard accessories  
 Patch Cords  
 Optical test equipment like OTDR, light meter and power meter  
 Various types of junction boxes(Clousers), Cleaver, Isopropyl

**Recommended Software:**

NIL

**Text Books:**

Training material for students supported through affiliated Training Providers.

**Reference Books**

NA

## ESDM Courses (Installation Engineer (Layer 2 & Layer 3))

**Level Code:**  **Vertical Name:**

**Course Code:**  **Course Name:**

### Objective of the Course:

An Installation engineer is responsible for installing L2-L3 equipment in the site and carrying out site acceptance testing. As an optional responsibility the engineer may need to undertake commissioning of the site based on network topology.

### Learning Outcomes:

By end of the training, the person should be able to perform the following activities:

#### **TEL/N6300 (Installation of SDH, DWDM/L2, L3 equipment)**

1. Verifying the Shipment
2. Undertake Installation as per guidelines
3. Connect Power and Traffic cable
4. Record and Report
5. Health and Safety

#### **TEL /N6303 (Undertake Acceptance Testing of L2 & L3 equipment)**

1. Develop site acceptance testing plan and test Procedure
2. Configure equipment as per guideline
3. Label ports and cables
4. Test Effectiveness and close activity
5. Report and Record

#### **TEL /N6304 (Commissioning of L2 & L3 equipment)**

1. Understand Network topology and Equipment Provisioning
2. Develop commissioning plan and test Procedure
3. Configure equipment as per guideline
4. Test Effectiveness and close activity
5. Report and Record

### Expected Job Roles:

Installation Engineer  
Testing & Commissioning Engineer

**Duration of the Course  
(in hours)**

400 Hrs

**Minimum Eligibility  
Criteria and pre-  
requisites, if any**

Diploma

**Professional Knowledge:**

Understand basic Equipment category, transmission media (Optical / Electrical)  
Need and requirement of earthing, mechanism to maintain earthing pit to absolute zero  
Usage of cable connectors, cable ties and cable tray  
Understand Site installation checklist and critical punch points  
OSI, LAN, MAN, WAN architecture and protocols  
Internet Protocol – TCP/IP, IP addressing, sub-netting  
IP Routing protocols – RIP, OSPF, IGRP  
Ethernet Networking, functionality of Ethernet test equipment  
Layer 2 switching technologies  
Layer 3 switching technologies

**Professional Skill:**

Equipment Installation/Operating Skills  
Testing & Calibration skills  
Technical Interpretation Skills  
Analytical Skills  
Problem Solving Skills  
Managerial Skills

**Core Skill:**

Basic Reading and Writing Skills  
Communication Skills  
Basic Project Management Skills  
Interpretation Skills  
Interpersonal Skills

## Detailed Syllabus of Course

| Module. No                               | Module. Name                                     | Minimum No. of Hours |
|--|--|----------------------|
| 1.                                       | As per the NOSs listed in the Qualification pack |                      |
| <b>Total Theory / Lecture Hours:</b>     |  | 60                   |
| <b>Total Practical / Tutorial Hours:</b> |  | 90                   |
| <b>Total Hours:</b>                      |  | 150                  |

**Recommended Hardware:**

L2/L3 Switching Equipment  
 Cisco Router, Network with PCs  
 All requisite Installation material including cables and connectors  
 Tools and equipment

**Recommended Software:**

System Software for Router, L2, L3 Switches

**Text Books:**

Training material for students aligned with TSSC QP created by affiliated Training Providers.

**Reference Books:**

NA

**ESDM Courses**  
**(Installation Engineer – SDH & DWDM)**

**Level Code:**  **Vertical Name:**

**Course Code:**  **Course Name:**

**Objective of the Course:**

An Installation engineer is responsible for installing SDH / DWDM equipment in the site and carrying out site acceptance testing. As an optional responsibility the engineer may need to undertake commissioning of the site based on network topology.

**Learning Outcomes:**

By end of the training, the person should be able to perform the following activities:

**TEL/N6300 (Installation of SDH, DWDM/ L2, L3 equipment)**

1. Verifying the Shipment
2. Undertake Installation as per guidelines
3. Connect Power and Traffic cable
4. Record and Report
5. Health and Safety

**TEL /N6301 (Acceptance Testing of SDH, DWDM equipment)**

1. Develop site acceptance testing plan and test Procedure
2. Configure equipment as per guideline
3. Label ports and cables
4. Test Effectiveness and close activity
5. Report and Record

**TEL /N6302 (Commissioning of SDH, DWDM equipment)**

1. Understand Network topology and Equipment Provisioning
2. Develop commissioning plan and test Procedure
3. Configure equipment as per guideline
4. Test Effectiveness and close activity

Report and Record

Installation of Equipment

Acceptance Testing of Equipment

Commissioning of Equipment

**Expected Job Roles:**

Installation Engineer  
Testing & Commissioning Engineer

**Duration of the Course  
(in hours)**

400 Hrs

**Minimum Eligibility  
Criteria and pre-  
requisites, if any**

Diploma

**Professional Knowledge:**

Understand basic Equipment category, transmission media (Optical / Electrical)  
Need and requirement of earthing, mechanism to maintain earthing pit to absolute zero  
Usage of cable connectors, cable ties and cable tray  
Understand Site installation checklist and critical punch points  
PDH and SDH technology, limitations and advantages  
DWDM technology, key components, architecture, applications  
Optical Add-Drop Multiplexers  
Optical Fiber Transmission, login cables  
Functionality of test equipment, line tester, Ethernet tester  
DWDM amplifiers, MDU units, RODAM features and configurations

**Professional Skill:**

Equipment Installation/Operating Skills  
Testing & Calibration skills  
Technical Interpretation Skills  
Analytical Skills  
Problem Solving Skills  
Managerial Skills

**Core Skill:**

Basic Reading and Writing Skills  
Communication Skills  
Basic Project Management Skills  
Interpretation Skills  
Interpersonal Skills

**Detail Course Outline:**

| <b>Module. No</b>                        | <b>Module. Name</b>                              | <b>Minimum No. of Hours</b> |
|--|--|-----------------------------|
| 1.                                       | As per the NOSs listed in the Qualification pack |                             |
|  |  |                             |
| <b>Total Theory / Lecture Hours:</b>     |  | 180                         |
| <b>Total Practical / Tutorial Hours:</b> |  | 220                         |
| <b>Total Hours:</b>                      |  | 400                         |

**Recommended Hardware:**

Lab should consists of SDH equipment's, L2 and L3 switching, CWDM / DWDM, and EMS. All these equipment's should be fully equipped with necessary cabinets, cards, chassis, Back plane, accessories, Lasers, Software and licenses.

**Recommended Software:**

System Software will be bundled with equipment

**Text Books:**

Training material for students supported through affiliated Training Providers.

**Reference Books:**

NA