

C o n t e n t s

Detailed Vocational Contents, Skill Sets & Equipment

1. Mobile Telecom System
2. Digital Switching Systems and Next Generation Networks
3. Telecom Support Infrastructure
4. Microwave Stations
5. Broadband Networks
6. Optical Fiber Networks
7. Telecom Solution for Corporate and Business Houses

1. Specialization: Mobile Telecom System

Certificate Level - I

		Hrs.
1	Identification of Telecom & End User Telecom Devices – Mobile Hand Sets, CPE, Modems, Computer. Identification, of BTS Site,	40
2	Components – BTS Racks, Feeder Cable, Cabinets, Connectors, Antennas, Media Connectivity Components.	80
3	Identification of BTS Site Alarms – Infra Alarms – Fire, Air Condition, Battery, Power Plant, Fire, Mains Failure, Low Fuel, Door Open.	40
4	Computer Fundamentals: Configuration and Customisation of Desktop environment	6
5	Office tools: MS Word	8
6	Office tools: MS Excel	12
7	Office tools: MS PowerPoint	8
8	Internet Concepts: Websites, e-mail,	6
9	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
	Total Vocational Content	206

Skill Set

1	Identify mobile handset, customer premise equipment, modems
2	Identify BTS site, power and civil infra
3	Identify BTS racks, feeder cable, cabinets, connectors, antennas, media connectivity,
4	Identify BTS site equipment and infra alarms like faulty card alarm, battery low voltage alarm, fire alarm, temperature alarm, door open alarm.
5	Load operating system, antivirus etc.
6	Type simple letter in English and Hindi in word format.
7	Use Excel sheet, prepare table , data sheets.
8	Use M.S. Power point for simple presentations.
9	Use websites for downloading information,
10	Use email for communications, attach files.

Lab Equipments & Device Required

1	BTS equipment along-with cables and antenna assembly.
2	Mobile handset & SIM, CPE and modem
3	Live BTS sites
4	5 number of PC's with MS office, antivirus and internet connection

BATCH SIZE:15

Specialization: Mobile Telecom System

Certificate Level - II

		Hrs.
1	Familiarization of BTS Site Components - BTS racks, cabinets , feeder cable, connectors, antennas, media connectivity components,	50
2	Familiarization of Site Alarms - Fire , Air Condition , Battery , Power Plant ,Mains Failure, Media Disconnection, Low Fuel, Fire, Door Open	80
3	Familiarization of Types of BTS Towers – Ground Based Towers , Roof Top Towers & Pole Mounted Towers and Their Uses, With Site Visit.	50
4	Familiarization of Infra Used at BTS Site – Air Condition , Battery , Power Plant, Electrical Earth.	50
5	Hardware Components of a Computer system: Identify and Check Status Of Devices, Install New Devices	6
6	Operating System and Application Software: Installation and configuration	10
7	Introduction to the components of Computer Networking: Cables, Switches, Routers, WAP	8
8	Practical with UTP Cables:	6
9	Practical in LAN: Finding fault and trouble-shooting	10
10	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
	Total Vocational Content	276

Skill Set

1	Segregate components of BTS site equipment, antenna, mount etc
2	Extend power supply to main equipment and support transmission equipment
3	Distinguish between different types of towers and their assembly elements.
4	Understand the importance of battery , power plant, SMPS module and Engine alternator for running of the BTS site
5	Understand the typical connection from AC mains to the equipment via SMPS modules and battery
6	Assemble and de-assemble the different components of desk top computer.
7	Install operating systems inside the desk top computer, install antivirus inside the computer.
8	Understand different types of cables and connectors used in computer networks like RJ-11, RJ-45, CAT-5/6 cable, patch cord, Switch board cable
9	Understand Switches , Routers and Bridges used in LAN and WAN networks.
10	Carry out tests on LAN and WAN

Specialization: Mobile Telecom System

Lab Equipment and Devices Required

1	BTS equipment along-with cables and antenna assembly, battery & power plant.
2	Mobile handset & SIM,CPE and modem
3	Live BTS site - with RTT, GBT PMT etc.
4	5 number of PC's with ms office, antivirus and internet connection
5	LAN- Cables & Connectors, Switches , Routers and Bridges.

BATCH SIZE = 15.

Specialization: Mobile Telecom System

Certificate Level -III

		Hrs.
1	Functioning of BTS Site Components -BTS Racks, Cabinets, Feeder Cable, Connectors, Antennas, Media Connectivity Components.	80
2	Functioning Site Alarms - Fire , Air Condition , Battery , Power Plant ,Mains Failure , Media Disconnection, Low Fuel, Fire, Door Open	80
3	Functioning of Types of BTS Towers – Ground Based Towers, Roof Top Towers & Pole Mounted Towers And Their Uses, With Site Visit.	80
4	Functioning of Infra Used at BTS Site – Air Condition, Battery, Power Plant, Electrical Earth.	50
5	Internet: Services available	6
6	Database Management Tool and Applications	10
7	Information to HTML & XML	10
8	Website designing	10
9	Societal impacts of IT	4
10	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 3 hours)	9
	Total Vocational Content	339

Skill Set

1	Check VSWR, Fire alarms , Temperature alarms, Battery low voltage alarms, media alarms
2	Understand the usage of tower for particular type and weight of Antenna.
3	Understand the foundation of tower
4	Understand the assembly of different elements of tower and fixing of plateforms, waveguide runaway, ladder, support.
5	Understand the role of battery, SMPS module, AVR, Engine Alternator, Changeover Switch,
6	Measure earth resistance of tower, equipment room.
7	Understand various services offered by internet
8	Understand Data Base Management tools and applications
9	Make files and spread sheets in HTML and XML and design websites as per requirement of the customer '

Specialization: Mobile Telecom System

Lab Equipment and Devices Required

1	BTS equipment along-with cables and antenna assembly, battery & power plant.
2	Mobile handset & SIM, CPE and modem
3	Live BTS site - with RTT, GBT PMT etc.
4	5 number of PC's with ms office, DBMS tools and internet connection
5	VSWR meter / site master.
6	Megger, multi-meter.

BATCH SIZE = 12.

Specialization: Mobile Telecom System

Certificate Level- IV

		Hrs.
1	Preparation of Check List and Block Schematic for Maintenance -BTS Racks, Cabinets, Feeder Cable, Connectors, Antennas, Media Connectivity Components	50
2	Preparation of Check List and Block Schematic for Maintenance of Active & Passive Infrastructure -Power Plant, Battery, Electrical Earth, RF Cable, Engine Alternator ,AC Supply System ,DC Supply System ,Aviation Light System , Protected Devices, Switch Gears Etc.	100
3	Replacement Level Routing Maintenance -	100
4	Advanced Computer Networking: Configuration of router, Unix commands, Protocols used in each layer of OSI,IP addressing , IPV-4 and IPV-6 basics	50
5	Mini-Project1 : Project concerned with GSM Switch	20
6	Field Visits: This is to be organized on live GSM MSC, BSC and BTS	12
7	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	344

Skill Set

1	Make check list and block schematic to depict the connectivity of cells with BTS and BTS with BSC and BSCs with MSCs and Media gateway
2	Make check list and block schematic for power plant , battery, Electrical earth, engine alternator , AC supply systems. DC supply system, Aviation lights, Switch gear etc
3	Maintain the log of faulty and repair cards and manage inventory of cards
4	Make base for the installation of the BTS equipment
5	Make false flooring in the equipment room for electrostatic discharge
6	Understand configuration of the BTS and its relation to the traffic in particular direction.
7	Orient antenna in case of drift due to air or change of traffic in a particular direction
8	Configure the router , Switches and Bridges
9	Understand protocols used in OSI Models
10	Understand IPV-4 and IPV-6 protocols

Specialization: Mobile Telecom System

Lab Equipment and Devices required

1	BTS equipment along-with cables and antenna assembly, battery & power plant.
2	Mobile handset & SIM, CPE and modem
3	Live MSC, BSC & BTS site.
4	5 number of PC's with dual operating system- MS windows & unix, MS office, DBMS tools and internet connection

BATCH SIZE = 12.

Specialization: Mobile Telecom System

Certificate Level-V

		Hrs.
1	Telecom Basics & Electrical Earth System Maintenance	80
2	BTS Sites Power Supply , Power Plant , D G and Battery Maintenance	80
3	Fundamentals of active & passive infrastructure maintenance check list for routine maintenance.	80
4	Wave guide, antenna, diagnostic testing, maintenance & operations of the site, site visit of a working site. Level -1 & Level -2 maintenance jobs on BTS & its support equipment. Supervision of telecom equipments and trouble shooting. Soft tools for communication.	80
5	Mini-Project1 : Project concerned with Digital Mini Links	40
6	Mini-Project1 : Project concerned with Mobile Back Haul	40
7	Mega-Project1: Project concerned with 2G network	50
8	Field Visits: This is to be organized on live 2G/3G Equipment	50
9	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers	24
10	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	536

Skill Set

1	Understand the basic theory of communications system and protection of telecom equipment from surges and exterior voltages
2	Maintain power supply, power plant, DG sets and Battery.
3	Prepare check list for the maintenance of active and passive infrastructure concerned BTS site
4	Carry out BTS testing for power and frequency
5	Carry out RF testing.
6	Carry out diagnosis of faults and restore the same.
7	Carry out mini projects on Digital mini links
8	Carry out min projects on mobile back hauls
9	Carry out mega project concerned with 2G networks
10	Understand specifications given in the equipment manual and interrogate vendor for modifications/corrections/up-gradations.

Specialization: Mobile Telecom System

Lab Equipment and Devices required

1	BTS equipment along-with cables and antenna assembly, battery & power plant.
2	Mobile handset & SIM, CPE and modem
3	Live BTS site - with copper, OFC & microwave back-haul.
4	Live 2G & 3G MSC, BSC / RNC site.
5	VSWR meter / site master.
6	Multi-meter.
7	Engineering handset.
8	5 number of PC's with MS office, DBMS tools and internet connection

BATCH SIZE = 10.

Specialization: Mobile Telecom System

Certificate Level - VI

		Hrs.
1	Preparation of Check List for Installation and Commissioning of Full BTS, Node-B & E-Node-B)	50
2	Preparation of check list for installation and commissioning of active & passive infrastructure installation- Power Plant, Battery, Electrical Earth, RF Cable, Engine Alternator, AC Supply System ,DC Supply System, Aviation Light System, Protected Devices, Switch Gears etc.	50
3	Identification of Tools and Equipment for Installation and Commissioning of Active & Passive Infrastructure , Full BTS, Node-B & E-Node-B) , Testing Of Power Plant, Battery, Electrical Earth, RF Cable, Engine Alternator ,Ac Supply System ,Dc Supply System , Aviation Light System Protected Devices, Switch Gears etc.	60
4	Antenna Fixing and Antenna Installation	60
5	Feeder Cable , Power Plant, Battery, Electrical Earth, Cabling at New Installation	60
6	Site visit of a site under installation – demo for installation & commissioning of new BTS site.	60
7	Mini-Project1 : Project concerned with Digital Microwave System	40
8	Mini-Project1 : Project concerned with Optical Fibre Cable system	40
9	Mega-Project1: Project concerned with Cell Planning	50
10	Field Visits: This is to be organized on live 3G and Media Gateway	50
11	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers in the field of transmission	24
12	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	556

Skill Set

1	Prepare of the check list for the installation and maintenance of the BTS/BSC/MSC
2	Prepare the check list for the installation of Battery, power plant, Engine alternator, AVR,DCDB, MCB, Fire Fighting system.
3	Operate tools and measuring instruments for the testing and commissioning of GSM equipments, Battery, Power plant and Engine Alternator
4	Install and orient the antenna.
5	Laying and Clamping of the feeder cable
6	Understand the operation of RF tool on computer/Laptop
7	Carry out mini project on Digital Microwave System.
8	Carry out mini project on Optical Fiber Cable System.
9	Carry out Cell Planning
10	Integrate media gateway with the MSC switch

Specialization: Mobile Telecom System

Lab Equipment and Devices required

1	BTS equipment along-with cables and antenna assembly, battery & power plant.
2	Mobile handset & SIM, CPE and modem
3	Live BTS site - under installation.
4	Live 2G & 3G MSC / media gateway, BSC / RNC site.
5	VSWR meter / site master.
6	Multi-meter.
7	Engineering handset.
8	5 number of PC'S with MS office, DBMS tools and internet connection
9	Drive test tool and cell planning tool kit.

BATCH SIZE = 10.

Specialization: Mobile Telecom System

Certificate Level-VII

		Hrs.
1	Physical installation & commissioning of full BTS, Node-B & E-node-B)	80
2	Fundamentals of active & passive infrastructure installation- Power Plant, Battery, Earthing, RF Cable, Engine Alternator ,AC Supply System ,DC Supply System ,Aviation Light System , Protected Devices, Switch Gears etc.	80
3	Site Visit of a Site Under Installation – Installation of Earthing System , Inhalation of Antenna Inhalation of BTS Inhalation of Infra : Hands on Practice.	80
4	Alarm Installation – Alarm Panel Installation , Connection of Different Wires Coming From Infra	80
5	Demonstration of on Site Final Testing- Media(Loop Break Test) , Electrical Earth Testing (Through Megger) , AC Voltage and Current Testing DC Voltage Testing Battery Output Voltage Testing BTS, RF, Power Testing , RF Cable Swap Testing	80
6	Documentation of Installation & Commissioning BTS, Node-B & E-node-B),Documentation for Acceptance Testing	80
7	Mini-Project1 : Project concerned with Digital Microwave System	40
8	Mini-Project1 : Project concerned with Optical Fibre Cable system	40
9	Mega-Project1: Project concerned with Radio Modem, Back Haul Optical Links like CP-8	50
10	Field Visits: This is to be organized on live 3G BSC, Hub, MSC, BTS	50
11	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers in the field of transmission	24
12	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	696

Specialization: Mobile Telecom System

Skill Set

1	Supervise supply, delivery , installation and commissioning of BTS equipment and support infrastructure
2	Supervise supply, delivery , installation and commissioning of BSC equipment and support infrastructure
3	Supervise supply, delivery , installation and commissioning of MSC, Media Gateway equipment and support infrastructure
4	Install of Electrical Earth system of different types like ring earth, pit earth, chemical earth.
5	Install Alarm panel and Fire fighting equipment
6	Test all the parameters of the equipment and Infra as per the standard test schedule of the manual
7	Prepare documentation of the commissioned system along with detailed test reports
8	Carry out mini project on Digital Microwave System on live working equipment
9	Carry out mini project on Optical Fibre system on live working fibre/system
10	Carry out mega project on Radio modem, mini links, optical links like CP-8

Lab Equipment and Devices required

1	BTS equipment along-with cables and antenna assembly, battery & power plant.
2	Mobile handset & SIM, CPE and modem
3	Live BTS site - under installation.
4	Live 2G & 3G MSC / media gateway, BSC / RNC site.
5	VSWR meter / site master.
6	Multi-meter, Megger.
7	Engineering handset.
8	5 number of PC'S with MS office, DBMS tools and internet connection
9	Drive test tool and cell planning tool kit.

BATCH SIZE = 10.

DIGITAL SWITCHING SYSTEMS & NEXT GENERATION NETWORKS

Specialization: Digital Switching Systems & Next Generation Networks

Certificate Level- I

		Hrs.
1	Tools Identification: Different Screw drivers, L- Keys, Spanners, Multi-Meters, Drilling Machine & Bits , KRON- OSA Tool etc.	30
2	Subscriber/ User device identification: Telephone instruments : Analog(Decadic/DTMF), Splitter, Rosette/LJU, ISDN-Digital, NT,TA, ADSL2 Modem, Handling of equipments etc.	30
3	Cable Identification: Switch Board Cable, Jelly Filled cable, Optical Fiber Cable(OFC), CAT5 Cable, Drop wire, Jumper wire, Power Cable etc.	20
4	Connector Identification: Euro, D, LC/PC, HC/PC, Banana, RJ-11, RJ-45,Sx,Lx,Zx etc. type connectors	10
5	TDM Telecom Equipment Familiarisation: Identification of various exchanges and their location C-DoT,AXE-10, EWSD, 5ESS & OCB-283, DLC, AN Rack, etc.	70
6	NGN Telecom Equipment Familiarisation: Identification of various exchanges and their location Class-4 NGN IP-TAX node, Class-5 NGN IMS based node etc.	20
7	Computer Fundamentals: Configuration and Customisation of Desktop environment	6
8	Office tools: MS Word	8
9	Office tools: MS Excel	12
10	Office tools: MS PowerPoint	8
11	Internet Concepts: Websites, e-mail,	6
12	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
	Total Vocational Content	226

Digital Switching Systems & Next Generation Networks

Skill Set

1	Identify tools
2	Identify telephone instruments and related accessories
3	Identify different type of cables used in telecom network
4	Identify different type of connectors used in telecom network
5	Identify the critical,major, minor alarms generated by the system
6	Assistance for operation of the equipment
7	Unpacking of the material
9	Identify the computer parts like monitor, CPU, keyboard, mouse etc.
10	Get acquainted with the preliminary use of MS Office Application such as Word, Excel spreadsheet, Power Point Presentation
11	Opening of websites, Sending & receiving of e-mails

Lab Equipment and Devices required

1.	Screw drivers set, L- Keys set, Spanners set, Digital Multi-Meter, Drilling Machine & Bits , KRON- OSA Tool etc.
2.	Telephone instruments : Analog(Decadic/DTMF), Splitter, Rosette/LJU, ISDN-Digital, NT,TA, ADSL2 Modem
3.	Switch Board Cable, Jelly Filled cable, Optical Fiber Cable(OFC), CAT5 Cable, Drop wire, Jumper wire, Power Cable etc.
4.	Euro, D, LC/PC, HC/PC, Banana, RJ-11, RJ-45,Sx,Lx,Zx etc. type connectors
5.	New Technology(NT) Digital Switching Systems EWSD, OCB-283, 5ESS, C-DoT,
6.	NGN Class-4 (IP-TAX) lab , NGN (Class-5) Lab
7.	Personel Computers with MS Office, DBMS tools and Internet connection

BATCH SIZE :30

Digital Switching Systems & Next Generation Networks

Certificate Level- II

		Hrs.
1	Alarm System: Fire safety & Fire Alarm, Power supply, Air-conditioning	50
2	Site management-General: Opening and closing of equipment room, Cleaning/ dusting of equipments/ Filters, and Familiarisation with equipment in the switch-room	50
3	Site management-Customer: Booking of complaint, Knowledge of CPEs (Customer Premises Equipment), Wiring, Testing of CPEs	70
4	Description of Subscriber features: Dynamic STD Locking, Call waiting, Call Diversion/Transfer, Abbreviated dialing, Hot-line etc.	50
5	Hardware Components of a Computer system: Identify and check status of devices, install new devices	6
6	Office tools: MS Word	8
7	Office tools: MS Excel	12
8	Office tools: MS PowerPoint	8
9	Internet Concepts: Websites, e-mail,	6
10	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
	Total Vocational Content	266

Skill Set

1	Observation & Identification of alarms of fire system panels
2	Identify faulty unit/card
3	Check card health status, major, minor alarms recognition and corrective action
4	Eject and insert cards under supervision thus can assist the technician
5	Respond to remote stations demands like giving loop/break etc.
6	Status monitoring of card health
7	Card repair and replacement management
8	Observing the status of Network Element in Local Craft Terminal(LCT)
9	Carry out local shifting of the equipments
10	Measure input DC voltage at the equipments
11	Cleaning of different filters and switch room equipments
12	Use spanner set, drill machine , lacing ties , gatties, lugs, tapes etc.
13	Switch-on and Switch-off the Engine Alternator Set
14	Describe the subscriber feature to customers/subscribers
15	Physical placement of the equipment inside the room as per the approved drawing
16	Carryout testing of CPE
17	Use MS Word, Excel, power point, website, e-mail etc.
18	Recognize various internet applications
19	Maintaining of appropriate temperature and humidity in the equipment room
20	Testing of fire alarm system

Digital Switching Systems & Next Generation Networks

Lab Equipment and Devices required

1.	Fire safety & Fire Alarm, Power supply system, Air-conditioning System
2.	Exchange Equipment Room
3.	Switch-room along with MDF
5.	Personel Computers with MS Office, DBMS tools and Internet connection

BATCH SIZE :30

Digital Switching Systems & Next Generation Networks

Certificate Level -III

		Hrs.
1	Study of different types of cable, Colour schemes and Jointing	50
2	Study of MDF/DDF/IDF tag blocks, Connectors, Pins and Line & Trunk wiring	50
3	Usage of various tools:- Multi-meter/ tester , Earth meggar, Crimping tools, etc.	50
4	Minor repair of CPE and other device used in RLU/RSU/DLU and exchange etc.	70
5	Alarms clearance in RLU/RSU/DLU and exchange etc.	76
6	Energy Conservations & Management: Proper scaling of SMPS modules, Energysing of SMPS: by AC mains and Gen Set. Storing of backup in secondary cells(Proper rating of batteries). During power failures secondary cells back up to be used till terminal voltage drops to -46 V, only after that Engine alternator to be started. Timely change of filters in E/A, Maintenance of Dynamo and cells in proper functioning conditions.	12
7	Internet: Services available	6
8	Database Management Tool and Applications	10
9	Information to HTML , XML etc.	10
10	Website designing	10
11	Societal impacts of IT	4
12	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 3 hours)	9
	Total Vocational Content	357

Skill Set

1	Understand parameters of the equipment and testing and measuring instrument .
2	Calibrae tesing instruments depending on say temperature, ampere, voltage and watts
3	Connect measuring instrument on testing points of the equipment.
4	Make relevant adaptable connectors both straight connectors and cross connectors as per the requirement
5	Comprehend the tolerance of the battery set and its DC current capacity
6	Optimum use of free cooling system to reduce AC usage
7	to carryout testing of voltage levels at each stage right from battery to DCDB to the equipment ports.
8	Measure various parameters with testing instrument/tool.
9	Rectification of fault conditions & restoration of services under the guidance from supervisor
10	Explain services available in Web and internet
11	Get acquainted with Database Management Tools
12	Explain the techniques of designing of websites.

Digital Switching Systems & Next Generation Networks

Lab Equipment and Devices required

1.	Switch Board Cable, Jelly Filled cable, Optical Fiber Cable(OFC), CAT5 Cable, Drop wire, Jumper wire, Power Cable etc.
2.	Switching Equipment along with MDF, DDF, IDF .
3.	Multi-meter/ tester , Earth meggar, Crimping tools, etc.
4.	Power plant along with Battery, EA/DG Set .
5.	Working switching system with Remote Line Unit(RLU)/ Remote Subscriber Unit(RSU)
6.	Personel Computers with MS Office, DBMS tools and Internet connection

BATCH SIZE :25

Digital Switching Systems & Next Generation Networks

Certificate Level- IV

		Hrs.
1	Overview of system architecture related to different NT switching systems, System features and system requirement, record of spares.	40
2	Study of racks , suites, frame/shelf, modules and their alarms, Recording/handling of modules in system/store etc.	46
3	Study of Line & Trunk testing, Possible status of Line/Trunk, and Module of line and trunk etc.	50
4	Testing of Line & Trunk using system i.e. automatic and manual and reporting of alarms to expert	50
5	Testing of common control equipments and Reporting of alarms to expert	50
6	NGN: Overview of NGN, IP Transport Network, Hardware modules, functions and various interfaces in Next Generation Switch	60
7	Advanced Computer Networking: Configuration of router, Unix commands, Protocols used in each layer of OSI, IP addressing , IPv-4 and IPv-6 basics	50
8	Mini-Project1 : Project concerned with Digital Switching System	20
9	Field Visits: This is to be organized on live NT Digital Switching Systems and Packet Switching Systems: Class-4 IP Switch (IP-TAX) and Class-5 IP Switch (Local)	12
10	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
11	Examinations	9
	Total Vocational Content	399

Skill Set

1	Prepare checklist of the jobs needed to carry out periodically in switch room /exchange equipment/instrument etc.
2	Operate the equipment under optimum condition
3	Maintain Digital Switching System and Power Plant including Battery Sets
4	Carryout testing of lines and Trunks and locate the fault
5	Check up periodically Air Conditioning Plant/Engine Alternator etc.
6	Check optimal use of energy saving techniques & devices.
7	Diagnose the fault type and take corrective action
8	Understand the function of hardware units in NGN
9	Make mini project i.r.o Switching System
10	Interpret the IP address and basic of Internet Technology

Digital Switching Systems & Next Generation Networks

Lab Equipment and Devices required

1.	New Technology(NT) Digital Switching Systems EWSD, OCB-283, 5ESS, C-DoT
2.	NGN Class-4 (IP-TAX) lab
3	Routers

BATCH SIZE :25

Digital Switching Systems & Next Generation Networks

Certificate Level -V

		Hrs.
1	Detailed study of : Subsystems (Signaling, Clock, Status panel) and units (Line terminal, Switching Network, Switching processors etc.)	36
2	Maintenance alarm: Maintenance, Types of alarm, Sources of alarm, Display & Search of alarm, System Panel Display, Creation of new alarm etc.	36
3	Line Terminal Unit Administration : Creation RLU /RSU/ DLU and their modules, Configuration of modules/ports, Diagnostic and fault codes	36
4	Subscriber Administration: Creation, Deletion and Modification of subscribers, Assignment of different phone plus facilities/ features. Use of different phone plus features.	36
5	CENTREX : Feature, data creation, services & use	10
6	V5.2 Interface: V5.2 data creation	10
7	Backup Administration: Saving of exchange data (Routine/Quarterly), Billing data and Traffic data etc.	20
8	System Administration: Time and Password management, LOG files, Annual Maintenance Contact and Handling of emergency in Exch etc.	30
9	RTP/RTCP, SIGTRAN, SIP, SIP-T, H.248/MEGACO etc. Protocols	25
10	MPLS Basics, Router/LAN Switch	25
11	Mini-Project1 : Project concerned with Packet Switching System(C-DoT MAX NG)	40
12	Mini-Project1 : Project concerned with Class-4 Packet Switching System (IP-TAX)	40
13	Mega-Project1: Project concerned with IMS based Class-5 Packet Switching System(Local)	50
14	Field Visits: This is to be organized on live Packet Switching Systems: Class-4 IP Switch (IP-TAX) and IMS based Class-5 IP Switch (Local)	50
15	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers in the field of Packet Switching System	24
16	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	480

Digital Switching Systems & Next Generation Networks

Skill Set

1	Locate the functional hardware of signalling system, clock system and exchange alarm status
2	Attend different types of alarms and their categorisation on priority basis along with acknowledgement
3	maintain functional hardware of RLU/RSU/DLU and their configuration
4	Create subscriber data
5	Create routing data
6	Create CENTREX feature
7	Create V5.2 environment
8	Carryout exchange/ Network administration
9	Carryout system administration & LOG file management
10	Take exchange backup and their schedule

Lab Equipment and Devices required

1.	New Technology(NT) Digital Switching Systems EWSD, OCB-283, 5ESS, C-DoT
2.	NGN Class-4 (IP-TAX) lab
3.	Routers
4.	NGN (Class-5 IMS based) Lab

BATCH SIZE :20

Digital Switching Systems & Next Generation Networks

Certificate Level- VI

		Hrs.
1	Physical (RLU/RSU/DLU) installation: Rack, Frame/shelf etc.	50
2	MDF and DDF Installation: Complete iron work with Tag Block etc.	50
3	Installation of different types of runway: Laying of different types of cable (Power/Telecom) etc.	50
4	Earthing: Preparation of earthing and extension of earthing to MDF/DDF and Switch room etc.	60
5	Electrical provision: AC and DC voltage device(SMPS), VRLA Battery, DCDB, Cable laying and termination etc.	60
6	NGN:Trunk Media Gateway(TMG) and Line Media Gateway(LMG)/ Line Access Gateways(LAG) in NGN	60
7	NGN:Dynamic Data Management in NGN	60
8	Mini-Project1 : Project concerned with Packet Switching System(C-DoT MAX NG)	40
9	Mini-Project1 : Project concerned with Class-4 Packet Switching System (IP-TAX)	40
10	Mega-Project1: Project concerned with IMS based Class-5 Packet Switching System(Local)	50
11	Field Visits: This is to be organized on live packet switching systems: Class-4 IP Switch (IP-TAX) and IMS based Class-5 IP Switch (Local)	50
12	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers in the field of packet switching system	24
13	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	606

Digital Switching Systems & Next Generation Networks

Skill Set

1	Prepare material for installation on, rack, frame, shelf basis
2	Carryout cable laying planning and calculations
3	Carryout installation of iron work of MDF/IDF/DDF etc. with Tag Block
4	Carryout installation of rack, shelves, run-way etc.
5	Carryout power supply requirement calculation
6	Prepare power cable laying diagramm alongwith termination port
7	Prepare earthing and extension of earthing to MDF/DDF and Switch room etc.
8	Install AC and DC voltage device(SMPS), VRLA Battery, DCDB, Cable laying and termination etc.
9	Identify & differentiate between TMG / LMG/ LAG

Lab Equipment and Devices required

1.	New Technology(NT) Digital Switching Systems EWSD, OCB-283, 5ESS, C-DoT,
2.	MDF/DDF
3.	Telecom / POWER CABLES
4.	POWER PLANT
5.	TMG/LMG /LAG
6.	NGN Class-4 (IP-TAX) LAB and NGN (Class-5 IMS based) Lab
7.	C-DoT MAX NG Lab

BATCH SIZE :20

Digital Switching Systems & Next Generation Networks

Certificate Level -VII

		Hrs.
1	Exchange Documents: Installation Manual, Operation Manual, Maintenance Manual, Equipment layout plan, Cable laying list, Equipment list, Allocation list etc.	40
2	Equipment Planning: Terminal equipment, Data processing peripherals etc..	56
3	Final installation checking: Hardware, Connectors, Cables, Fuses as per list/documents.	60
4	Acceptance Testing: Test schedule of exchange e.g. Pre Switch ON test, Test offererd after Power ON, Annexure bearing standards.	100
5	Commissioning: Testing of Exchange Equipment after power on, Setting up of terminals, Incorporation of operating software and exchange specific data.	60
6	NGN: Physical / Logical Configuration of SoftSwitch/IMS in NGN	60
7	NGN: Alarms & Reports in NGN	60
8	NGN:Saving procedure of software and database of SoftSwitch/IMS in NGN	60
9	Mini-Project1 : Project concerned with Packet Switching System(C-DoT MAX NG)	40
10	Mini-Project2 : Project concerned with Class-4 Packet Switching System (IP-TAX)	40
11	Mega-Project1: Project concerned with IMS based Class-5 Packet Switching System(Local)	50
12	Field Visits: This is to be organized on live packet switching systems: Class-4 IP Switch (IP-TAX) and Class-5 IP Switch (Local)	50
13	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers in the field of packet switching system	24
14	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 6 hours)	18
	Total Vocational Content	718

Digital Switching Systems & Next Generation Networks

Skill Set

1	Identify documentation of different hardware units, maintenance, layout plans, cable laying etc.
2	Identify internal data cable planning for different peripherals with internal connection of terminal equipment.
3	Carryout final check for installation of hardware, connectors, cables, fuses etc. as per documentation
4	Understand the different test mentioned in the A/T schedule
5	Carryout logical configuration of NGN, IMS Softswitches
6	Take all the different reports related to traffic / maintenance of NGN,IMS
7	Carryout saving procedure of software and database of SoftSwitch/IMS in NGN
8	Carryout final commissioning of exchange equipment.

Lab Equipment and Devices required

1	Exchange Documents
2	Terminal equipments, Data processing peripherals
3	Acceptance Testing(A/T) Schedule
4	Training Model Exchange
5	Soft Switch
6	C-DoT MAX NG Lab
7	IP-TAX(Class-4) LAB,
8	Class-5 IMS based NGN Lab

BATCH SIZE :20

TELECOM SUPPORT INFRASTRUCTURE

Specialization: Telecom Support Infrastructure

Certificate Level-I

		Hrs.
1	Identification of DG set equipments / components : Engine , alternator , fuel tank , exhaust system , silencer , battery , battery charger , base frame , radiator , fuel tank , control panel , air filter , lube oil filter , water separator , etc	15
2	Identification of Substation equipments / components : HT panel , transformer , LT panel , capacitor panel , HT cables , LT cable , Meters , CT , PT , MCCB , CB , RELAYS , earthing etc	15
3	Identification of Fire detection system equipments / components : Detectors , fire cable , fire alarm panel , repeater panel , etc	15
4	Identification of fire fighting system equipments / components : Jockey pump , fire pump , pressure switch , hydrant , foot valve , fire panel etc	15
5	Identification of building electrification equipments / components : conduit , junction box , coupler , fish wire , Distribution boards , MCB , exhaust fan , ceiling fan , switch , socket etc	15
6	Identification of BMS equipments / components: BMS panel , Ethernet cable, field cable, sensors - level, temperature, humidity etc	15
7	Identification of lift equipments / components : lift car , door , rope , counter weight , ARD device , control panel ,battery	15
8	Identification of Air-conditioning equipments / components: window A/C , split A/C , cassette A/C , package A/C , condenser , refrigerant piping , cabling , etc	15
9	Mobile communication tower & BTS : Identification of ground base tower, roof top tower, Guywire, self supported tower, vertical / horizontal gantry, working/resting platforms, aviation lamp, Lightning conductor, safety rings, BTS Shelter, Engine Alternator bed , Name board, compound wall etc.	40
10	Identification of civil environmental works : Such as false ceiling , false flooring , antistatic flooring , aluminium partition , wall paneling ; etc Building materials : cement, sand, bricks, stone aggregates & steel reinforcement.	40

11	Computer Fundamentals: Configuration and Customisation of Desktop environment	6
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Telecom Support Infrastructure

		Hrs.
12	Office tools: MS Word	8
13	Office tools: MS Excel	12
14	Office tools: MS PowerPoint	8
15	Internet Concepts: Websites, e-mail,	6
16	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
	Total Vocational Content	246

Skill Set

1	Identify Engine , alternator , fuel tank , exhaust system , silencer , battery , battery charger , base frame , radiator , fuel tank , control panel , air filter , lube oil filter , water separator , etc
2	Identify HT panel , transformer , LT panel , capacitor panel , HT cables , LT cable , Meters , CT , PT , MCCB , CB , RELAYS , earthing etc
3	Identify Smoke Detectors , fire cable , fire alarm panel , repeater panel , manual call points, remote indicator etc.
4	Identify Jockey pump , fire pump , pressure switch , hydrant , foot valve , fire panel, hose reel, first aid hose reel, nozzle etc
5	Identify conduit , junction box , coupler , fish wire , Distribution boards , MCB , exhaust fan , ceiling fan , switch , socket etc
6	Identify BMS panel , ethernet cable , field cable , sensors - level , temperature , humidity etc
7	Identify lift car , door , rope , counter weight , ARD device , control panel ,battery
8	Identify window A/C , split A/C , cassette A/C , package A/C , compressor, thermostat, blower, condensor , refrigerant piping , cabling , etc

Telecom Support Infrastructure

Lab Equipment and Devices required

1	Ground Based Tower System.
2	Telephone Exchange Building .
3	DG Set
4	Substation installation
5	Open AC units window, split, package, cassatte
6	Lift installation
7	BMS installation
8	Smoke detection exhibit lab/installation
9	Different fire extinguishers, wet riser installation
10	EI & Fans exhibit lab and installation

BATCH SIZE:15

Telecom Support Infrastructure

Certificate Level- II

		Hrs.
1	Familiarization of DG set equipments / components : Engine , alternator , fuel tank , exhaust system , silencer , battery , battery charger , base frame , radiator , fuel tank , control panel , air filter , lube oil filter , water separator , etc	15
2	Familiarization of Substation equipments / components : HT & LT panel , transformer , capacitor panel , HT cables , LT cable , Meters , CT , PT , MCCB , CB , RELAYS , earthing etc	15
3	Familiarization of Fire detection system equipments / components : Detectors , fire cable , fire alarm panel , repeater panel , etc	15
4	Familiarization of fire fighting system equipments / components : Jockey pump , fire pump , pressure switch , hydrant , foot valve , fire panel etc	15
5	Familiarization of building electrification equipments / components : conduit , junction box , coupler , fish wire , Distribution boards , MCB , exhaust fan , ceiling fan , switch , socket etc	15
6	Familiarization of BMS equipments / components : BMS panel , ethernet cable , field cable , sensors - level , temperature , humidity etc	15
7	Familiarization of lift equipments / components : lift car , door , rope , counter weight , ARD device , control panel , battery	15
8	Familiarization of Air-conditioning equipments / components: window A/C , split A/C , cassette A/C , package A/C , condensor , refrigerant piping , cabling , etc	15
9	Familiarization with ground base tower, roof top tower, Guywire, self supported tower, vertical / horizontal gantry, working/resting platforms, aviation lamp, Lightning conductor, safety rings, BTS Shelter, Engine Alternator, Name board, compound wall etc.	50
10	Familiarization with civil environmental works : Such as false ceiling , false flooring , antistatic flooring , aluminium partition , wall panelling etc Building materials familiarization : cement, sand, stone aggregates & steel reinforcement. plain concrete & reinforced cement concrete	50
11	Hardware Components of a Computer system: Identify and check status of devices, install new devices	6
12	Introduction to the components of Computer Networking: Cables, Switches, Routers, WAP	8
13	Practical with UTP Cables:	6
14	Practical in LAN: Finding fault and trouble-shooting	10
15	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
	Total Vocational Content	256

Telecom Support Infrastructure

Skill Set

1	Understand construction of Engine , alternator , fuel tank , exhaust system , silencer , battery , battery charger , base frame , radiator , fuel tank , control panel , air filter , lube oil filter , water separator , etc
2	Understand construction of HT panel , transformer , LT panel , capacitor panel , HT cables , LT cable , Meters , CT , PT , MCCB , CB , RELAYS , earthing etc
3	Understand construction of Smoke Detectors , fire cable , fire alarm panel , repeater panel , manual call points, remote indicator etc.
4	Understand construction of Jockey pump , fire pump , pressure switch , hydrant , foot valve , fire panel, hose reel, first aid hose reel, nozzle etc
5	Understand construction of conduit , junction box , coupler , fish wire , Distribution boards , MCB , exhaust fan , ceiling fan , switch , socket etc
6	Understand BMS panel , ethernet cable , field cable , sensors - level , temperature , humidity etc
7	Understand construction of lift car , door , rope , counter weight , ARD device , control panel ,battery
8	Understand construction of window A/C , split A/C , cassette A/C , package A/C , compressor, thermostat, blower, condenser , refrigerant piping , cabling , etc

Lab Equipment and Devices required

1	Ground Based Tower System.
2	Telephone Exchange Building.
3	Cut components of DG Set
4	Exhibit and cut components of Substation installation
5	Exhibits and cut componets of window, split, package, cassatte type ac units
6	Exhibits of components of Lift installation
7	Exhibits of components of BMS installation
8	Smoke detection exhibit lab/installation
9	Different fire extinguishers, wet riser installation
10	EI & Fans exhibit lab and installation

BATCH SIZE:15

Telecom Support Infrastructure

Certificate Level- III

		Hrs.
1	Functioning of DG set equipments / components : Engine , alternator , fuel tank , exhaust system , silencer , battery , battery charger , base frame , radiator , fuel tank , control panel , air filter , lube oil filter , water separator , etc	15
2	Functioning of Substation equipments / components : HT panel , transformer , LT panel , capacitor panel , HT cables , LT cable , Meters , CT , PT , MCCB , CB , RELAYS , earthing etc	15
3	Functioning of Fire detection system equipments / components : Detectors , fire cable , fire alarm panel , repeater panel , etc	15
4	Functioning of fire fighting system equipments / components : Jockey pump , fire pump , pressure switch , hydrant , foot valve , fire panel etc	15
5	Functioning of building electrification equipments / components : conduit , junction box , coupler , fish wire , Distribution boards , MCB , exhaust fan , ceiling fan , switch , socket etc	15
6	Functioning of BMS equipments / components : BMS panel , ethernet cable , field cable , sensors - level , temperature , humidity etc	15
7	Functioning of lift equipments / components : lift car , door , rope , counter weight , ARD device , control panel , battery	15
8	Functioning of Air-conditioning equipments / components: window A/C , split A/C , cassette A/C , package A/C , condenser , refrigerant piping , cabling , etc	15
9	Functioning of ground base tower, roof top tower, Guywire, self supported tower, vertical / horizontal gantry, working platform, resting platform, aviation lamp, Lightning conductor, safety rings, BTS Shelter, Engine Alternator, Name board, compound wall, Earthing etc.	120
10	Functioning of civil environmental works parts : false ceiling , false flooring , antistatic flooring , aluminium partition , wall panelling ;	55
11	Internet: Services available	6
12	Database Management Tool and Applications	10
13	Information to HTML & XML	10
14	Website designing	10
15	Societal impacts of IT	4
16	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 3 hours)	9
	Total Vocational Content	344

Telecom Support Infrastructure

Skill Set

1	Understand function of Engine , alternator , fuel tank , exhaust system , silencer , battery , battery charger , base frame , radiator , fuel tank , control panel , air filter , lube oil filter , water separator , etc
2	understand function of HT panel , transformer , LT panel , capacitor panel , HT cables , LT cable , Meters , CT , PT , MCCB , CB , RELAYS , earthing etc
3	understand function of Smoke Detectors , fire cable , fire alarm panel , repeater panel , manual call points, remote indicator etc.
4	understand function of Jockey pump , fire pump , pressure switch , hydrant , foot valve , fire panel, hose reel, first aid hose reel, nozzle etc
5	understand function of conduit , junction box , coupler , fish wire , Distribution boards , MCB , exhaust fan , ceiling fan , switch , socket etc
6	understand function of BMS panel , ethernet cable , field cable , sensors - level , temperature , humidity etc
7	lift car , door , rope , counter weight , ARD device , control panel ,battery
8	understand function of window A/C , split A/C , cassette A/C , package A/C , compressor, thermostat, blower, condenser , refrigerant piping , cabling , etc

Lab Equipment and Devices required

1	Site Visit to Ground Based Tower System.
2	Field Visit to Telephone Exchange.
3	DG Set installation
4	Substation lab: crimping tool, tong testers, meggers, power testers
5	Air conditioning lab: Anemometer, Psychrometer, Thermometers,
6	Lift installation
7	BMS lab: Multimeter
8	Smoke detection exhibit lab/installation: Multimeter, power tester
9	Different fire extinguishers, wet riser installation
10	EI & Fans exhibit lab and installation: Lux meter
11	Full tool kits one set for each lab: Screw drivers, power testers, pliers, cutters, aluminium ladder

BATCH SIZE:15

Telecom Support Infrastructure

Certificate Level- IV

		Hrs.
1	Operation methodology of DG set , Substation , fire fighting , fire alarm , building lighting / power plug , BMS system , lift , window A/C , split A/C , cassette A/C , package A/C	45
2	Operation documentation of DG set , Substation , fire fighting , fire alarm , building lighting / power plug , BMS system , lift , window A/C , split A/C , cassette A/C , package A/C : Format of log book , reading of various meters & recording / entering in the log book , frequency of recording of log book , movement of log book	45
3	Maintenance methodology of DG set , Substation , fire fighting , fire alarm , building lighting / power plug , BMS system , lift , window A/C , split A/C , cassette A/C , package A/C : Routine, Preventive & Break Down maintenance , Maintenance schedule : Daily , monthly , quarterly , annual checks	45
4	Maintenance documentation of DG set , Substation , fire fighting , fire alarm , building lighting / power plug , BMS system , lift , window A/C , split A/C , cassette A/C , package A/C : Format of maintenance document , format of complaint register , recording of maintenance activity in the maintenance register , movement of document	45
5	Maintenance of ground based tower, roof top tower, vertical / horizontal gantry, aviation lamp, Lightening conductor, stair with safety rings, BTS Shelter, Engine Alternator, compound wall etc.	40
6	Maintenance of civil environmental works : false ceiling , false flooring , antistatic flooring , aluminium partition , wall panelling ; etc	40
7	Mini-Project1 : Project concerned with planning of Power plant, Technical building design	20
8	Advanced Computer Networking: Configuration of router, Unix commands, Protocols used in each layer of OSI,IP addressing , IPV-4 and IPV-6 basics	50
9	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 3 hours)	9
	Total Vocational Content	339

Telecom Support Infrastructure

Skill Set

1	understand maintenance of Engine , alternator , fuel tank , exhaust system , silencer , battery , battery charger , base frame , radiator , fuel tank , control panel , air filter , lube oil filter , water separator , etc
2	understand maintenance of HT panel , transformer , LT panel , capacitor panel , HT cables , LT cable , Meters , CT , PT , MCCB , CB , RELAYS , earthing etc
3	understand maintenance of Smoke Detectors , fire cable , fire alarm panel , repeater panel , manual call points, remote indicator etc.
4	understand maintenance of Jockey pump , fire pump , pressure switch , hydrant , foot valve , fire panel, hose reel, first aid hose reel, nozzle etc
5	understand maintenance of conduit , junction box , coupler , fish wire , Distribution boards , MCB , exhaust fan , ceiling fan , switch , socket etc
6	understand maintenance of BMS panel , ethernet cable , field cable , sensors - level , temperature , humidity etc
7	understand maintenance of lift car , door , rope , counter weight , ARD device , control panel ,battery
8	Understand Maintenance of Window A/C , Split A/C , Cassette A/C , Package A/C , Compressor, Thermostat, Blower, Condenser , Refrigerant Piping , Cabling , etc.

Lab Equipment and Devices required

1	Site Visit to Ground Based Tower System.
2	Field Visit to Telephone Exchange.
3	DG Set installation
4	Substation lab: crimping tool, tong testers, meggers, power testers
5	Air conditioning lab: Anemometer, Psychrometer, Thermometers,
6	Lift installation
7	BMS lab: Multimeter
8	Smoke detection exhibit lab/installation: Multimeter, power tester
9	Different fire extinguishers, wet riser installation
10	EI & Fans exhibit lab and installation: Lux meter
11	Full tool kits one set for each lab: Screw drivers, power testers, pliers, cutters, aluminium ladder

BATCH SIZE:15

Telecom Support Infrastructure

Certificate Level- V

		Hrs.
1	Supervise the operator : Precautions to be taken during operation of DG set , Substation , fire fighting , fire alarm , building lighting / power plug , BMS system , lift , window A/C , split A/C , cassette A/C , package A/C ; review the operation log book ; frequency of review of log book , safe custody & life of log book / maintenance document.	75
2	Supervise the Routine / Preventive maintenance of DG set , Substation , fire fighting , fire alarm , building lighting / power plug , BMS system , lift , window A/C , split A/C , cassette A/C , package A/C , Break Down maintenance & Special maintenance to be done as per manufacturer recommendation of different equipments , review the maintenance document , frequency of review of document , safe custody of document , life of document .	75
3	Supervision of ground based tower, roof top tower, BTS Shelter, Engine Alternator, compound wall, Tower foundation, Testing of Cement, Steel, Stone Agg. , Reinforcement, Cement Concrete etc.	75
4	Supervision of civil environmental works : false ceiling , false flooring , antistatic flooring , aluminium partition , wall panelling ; etc	75
5	Mini-Project1 : Project concerned with civil works in telecom installations	40
6	Mini-Project2 : Project concerned with electrical works in telecom installations	40
7	Mega-Project1: Project concerned with latest trends in design of electrical and civil infrastructure	50
8	Field Visits: This is to be organized on technical buildings, power plants, in the main exchanges across the cities	50
9	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers	24
10	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	516

Telecom Support Infrastructure

Skill Set

1	Supervise the functioning of Engine , alternator , fuel tank , exhaust system , silencer , battery , battery charger , base frame , radiator , fuel tank , control panel , air filter , lube oil filter , water separator , etc
2	Supervise the functioning of HT panel , transformer , LT panel , capacitor panel , HT cables , LT cable , Meters , CT , PT , MCCB , CB , RELAYS , earthing etc
3	Supervise the functioning of Smoke Detectors , fire cable , fire alarm panel , repeater panel , manual call points, remote indicator etc.
4	Supervise the functioning of Jockey pump , fire pump , pressure switch , hydrant , foot valve , fire panel, hose reel, first aid hose reel, nozzle etc
5	Supervise the functioning of conduit , junction box , coupler , fish wire , Distribution boards , MCB , exhaust fan , ceiling fan , switch , socket etc
6	Supervise the functioning of BMS panel , ethernet cable , field cable , sensors - level , temperature , humidity etc
7	Supervise the functioning of lift car , door , rope , counter weight , ARD device , control panel ,battery
8	Supervise the functioning of window A/C , Split A/C , Cassette A/C , Package A/C , Compressor, Thermostat, Blower, Condenser , Refrigerant Piping , Cabling , Etc

Lab Equipment and Devices required

1	Site Visit to Ground Based Tower System.
2	Field Visit to Telephone Exchange.
3	Testing of building material.
3	DG Set installation
4	Substation lab: crimping tool, tong testers, meggers, power testers
5	Air conditioning lab: Anemometer, Psychrometer, Thermometers,
6	Lift installation
7	BMS lab: Multimeter
8	Smoke detection exhibit lab/installation: Multimeter, power tester
9	Different fire extinguishers, wet riser installation
10	EI & Fans exhibit lab and installation: Lux meter
11	Full tool kits one set for each lab: Screw drivers, power testers, pliers, cutters, aluminium ladder

BATCH SIZE:15

Telecom Support Infrastructure

Certificate Level- VI

		Hrs.
1	Best Installation practices of DG set , Substation , fire fighting , fire alarm , building lighting / power plug , BMS system , lift , window A/C , split A/C , cassette A/C , package A/C : loading & unloading & safe storage methodology of equipments , Installation methodology , tools required for installation , pre commissioning tests , post commissioning tests , As built drawing preparation , Handing over document preparation including warranty certificate , manufacturer operation & maintenance manuals ; conducting acceptance tests	250
2	Execution of ground based tower, roof top tower, BTS Shelter, Engine Alternator, compound wall, Tower foundation & erection, Testing of cement, Steel, Stone Agg. , Reinforcement, physical verification of material as per bill of quantities, study of drawings etc. Execution of plain concrete & reinforced cement concrete.	60
3	Provision of civil environmental works : false ceiling , false flooring , antistatic flooring , aluminium partition , wall panelling, physical verification of material as per bill of quantities, study of drawings etc.	80
4	Mini-Project1 : Project concerned with Digital Transmission Equipment,	40
5	Mini-Project2 : Project concerned with Optical Fibre Cable system	40
6	Mega-Project1: Project concerned with Latest Optical transmission technology	50
7	Field Visits: This is to be organized on live optical transmission systems: GPON, EPON, STM-16,DWDM, Network Management System	50
8	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers in the field of transmission	24
9	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 6 hours)	18
	Total Vocational Content	612

Telecom Support Infrastructure

Skill Set

1	Understand and Implement Best Installation practices for DG set , Substation , fire fighting , fire alarm , building lighting / power plug , BMS system , lift , window A/C , split A/C , cassette A/C , package A/C :
2	Implement loading & unloading & safe storage methodology of equipments ,
3	Devise best Installation methodology , arrange tools required for instalation ,
4	Carry out pre commissioning tests , post commissioning tests ,
5	Prepare As built drawing , Handing over document preparation including warranty certificate ,
6	Able to carry out functionalities described in manufacturer operation & maintenance manuals
7	conducting acceptance tests

Lab Equipment and Devices required

1	Site Visit to Ground Based Tower System.
2	Field Visit to Telephone Exchange.
3	Testing of building material.
3	DG Set installation
4	Substation lab: crimping tool, tong testers, meggers, power testers
5	Air conditioning lab: Anemometer, Psychrometer, Thermometers,
6	Lift installation
7	BMS lab: Multimeter
8	Smoke detection exhibit lab/installation: Multimeter, power tester
9	Different fire extinguishers, wet riser installation
10	EI & Fans exhibit lab and installation: Lux meter
11	Full tool kits one set for each lab: Screw drivers, power testers, pliers, cutters, aluminium ladder

BATCH SIZE:15

Telecom Support Infrastructure

Certificate Level- VII

		Hrs.
1	Installation , testing & commissioning of DG set , Substation , fire fighting , fire alarm , building lighting / power plug , BMS system , lift , window A/C , split A/C , cassette A/C , package A/C : loading & unloading & safe storage methodology of equipments , Installation methodology , tools required for installation , pre commissioning tests , post commissioning tests , As built drawing preparation , Handing over document preparation including warranty certificate , manufacturer operation & maintenance manuals ; conducting acceptance tests	300
2	Specifications of ground based tower, roof top tower, Tower foundation, Erection of tower, Painting of tower, BTS Shelter, Engine Alternator, compound wall, Testing of cement, Steel, Stone Agg. , Reinforcement, physical verification of material as per bill of quantities, study of drawings etc.	100
3	Specifications of civil environmental works : false ceiling , false flooring , antistatic flooring , aluminium partition , wall panelling, physical verification of material as per bill of quantities, study of drawings etc	100
4	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	512

Skill Set

1	Supervise supply, delivery , installation and commissioning of DG set, Substation, Fire fighting system.
2	Supervise supply, delivery , installation and commissioning of rooftop and ground based tower along with ring earthing.
3	Check specification of the material and equipment supply against the standard.
4	Install and commission BTS shelter
5	Verify the material as per the bill of quantity.
6	Prepare blue print of the drawing,

Telecom Support Infrastructure

Lab Equipment and Devices required

1	Site Visit to Ground Based Tower System.
2	Field Visit to Telephone Exchange.
3	Testing of building material.
3	DG Set installation
4	Substation lab: crimping tool, tong testers, meggers, power testers
5	Air conditioning lab: Anemometer, Psychrometer, Thermometers,
6	Lift installation
7	BMS lab: Multimeter
8	Smoke detection exhibit lab/installation: Multimeter, power tester
9	Different fire extinguishers, wet riser installation
10	EI & Fans exhibit lab and installation: Lux meter
11	Full tool kits one set for each lab: Screw drivers, power testers, pliers, cutters, aluminium ladder

BATCH SIZE:15

MICROWAVE STATIONS

2. Specialization: Microwave Stations

Certificate Level-I

		Hrs.
1	telecom familiarisation & identification of end user devices	50
2	Identification of Components of Microwave Station – Tower, Antenna, Feeder Cable, Equipment Bay, DDF, Power Supply etc.	80
3	Visit to Microwave Station	24
4	Computer Fundamentals: Configuration and Customisation of Desktop environment	6
5	Office tools: MS Word	8
6	Office tools: MS Excel	12
7	Office tools: MS PowerPoint	8
8	Internet Concepts: Websites, e-mail	6
9	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
	Total Vocational Content	200

Skill Set

1	Identify components of microwave communications system like: Antenna, Duplexer, Feeder Cable, DDF, DCDB
2	Pack and unpack the materials and equipments without damage
3	Fix outdoor unit in the antenna and connect the horn
4	Hoist the antenna over the tower
5	Climb the tower and assist in Installation of antenna subassembly
6	Use basic text in MS word
7	Use spread sheet and table in MS-Excel
8	Make presentation slide in power point
9	Use website ,check authentic website from the unauthentic website, use Email
10	Identify components of computer

Lab Equipment and Devices required

1	Parabolic antenna, Duplexer, Feeder cable, DDF, DCDB.
2	Horn feed, outdoor Unit.
3	Desktop Computer, Printer, Internet Modem, RJ-11 and RJ-45 cables.

BATCH SIZE:20

Microwave Stations

Certificate Level-II

		Hrs.
1	Familiarization of Components of Microwave Station -	35
2	Tower, Antenna, Feeder Cable, Equipment Bay, DDF, Power Supply etc.	35
3	Familiarization of Microwave Station Alarms – Alarm Panel, System Fail Alarm, Power Supply Failure etc.	60
4	Microwave Instruments – DTA, Power Meter, Multimeter ,Vswr Meter,Spectrum Analyser	50
5	Visit to microwave station – Familiarization with Components & Instruments.	40
6	Hardware Components of a Computer system: Identify and check status of devices, install new devices	6
7	Operating System and Application Software: Installation and configuration	10
8	Introduction to the components of Computer Networking: Cables, Switches, Routers, WAP	8
9	Practicals with UTP Cables:	6
10	Practicals in LAN: Finding fault and trouble-shooting	10
11	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
	Total Vocational Content	266

Skill Set

1	Connect different components like Feeder Cable with Antenna,Duplexer with waveguide, Directional coupler with waveguide.
2	Hoist the feeder cable over the tower and clamp it without bending.
3	Make connectors for feeder cable
4	Understand the meaning of various alarms on the alarm panel and alert the technician.
5	Use digital transmission analyser to check errors,
6	Use microwave power meter, VSWR meter, Spectrum analyser
7	Orient antenna as per the instruction of the supervisor/technician
8	Assemble and de-assemble desktop computer
9	Install and configure the operating systems in computer
10	Differentiate between connectors and cables used in computer to computer communications: like RJ-11,45 etc.

Microwave Stations

Lab Equipment and Devices required

1	Parabolic Antenna, Feeder Cable, Waveguide, Duplexer, Directional Coupler.
2	SMA connectors, Flexible RF connector.
3	Digital Transmission Analyser.
4	Microwave Power Meter, VSWR meter, Spectrum Analyser.
5	Desktop Computer, Printer, Internet Modem, RJ-11,RJ-45 connector.

BATCH SIZE:20

Microwave Stations

Certificate Level-III

		Hrs.
1	Functioning of Station Equipments and Tower Alarms, Infra Alarms	80
2	Functions of Infra Used at Microwave Station Site	80
3	Energy Conservation & Management – Principles and Practices.	70
4	Visit to Microwave Station-Equipment Functioning, Alarms & Energy Conservation Practices.	60
5	Internet: Services available	6
6	Database Management Tool and Applications	10
7	Information to HTML & XML	10
8	Website designing	10
9	Societal impacts of IT	4
10	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 3 hours)	9
	Total Vocational Content	339

Skill Set

1	Test the parameters of antenna and transmission systems
2	Take corrective actions setting right the alarm condition
3	Change the configuration of the equipment according to traffic
4	Take and make loop to test the remote stations
5	Read run hour meter, extend power supply to equipment from battery
6	Charge and discharge of battery as per schedule
7	Implement energy saving methods in equipment room
8	Use various internet services
9	Use HTML and XML
10	Design website

Lab Equipment and Devices required

1	VSWR meter, Spectrum Analyser, Microwave Power Meter, Microwave frequency meter.
2	Battery set of at least 600 AH , SMPS power plant of 100 Amps in each module.
3	Desktop Computer, Printer, Internet Modem, RJ-11,RJ-45 connector.

BATCH SIZE:20

Microwave Stations

Certificate Level-IV

		Hrs.
1	Operation of Microwave Station Equipments : Principles & Practices - Details upto Cards Level, & Antenna Assembly	72
2	Maintenance of Microwave Station Equipments : Principles & Practices - Details upto Cards Level, & Antenna Assembly	72
3	Preparation of Check List, Block Schematic – Documentation.	60
4	Onsite Training : Observation of O & M Practices.	60
5	Advanced Computer Networking: Configuration of router, Unix commands, Protocols used in each layer of OSI,IP addressing , IPV-4 and IPV-6 basics	50
6	Mini-Project1 : Project concerned with Microwave communications	20
7	Field Visits: This is to be organized on live Microwave systems	12
8	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	358

Skill Set

1	Assemble and de-assemble the equipment
2	Understand role of each card of the equipment
3	Operate the system without external support
4	Understand the principles and theory behind microwave communications
5	Prepare checklist for maintenance and test purpose.
6	Make block schematic to explain the functions and operations of the equipment
7	Configure router, Undertand Unix commands, IP addressing, IPV-4 and IPV6 basics
8	Understand Protocols used in each layer of OSI,
9	Understand IP addressing, IPV-4 and IPV6 basics
10	Complete the small scale assigned project/task related with microwave communications

Lab Equipment and Devices required

1	Fully Equipped Microwave Equipment with Power Supply
2	Router, Bridges, Desktop computer, Rj-45 cables

BATCH SIZE:20

Microwave Stations

Certificate Level-V

		Hrs.
1	Review of operation & maintenance principles – microwave system components and alarms.	50
2	Supervision of microwave equipment : microwave equipment, power, supply system, tower & antenna assembly etc.	60
3	Identification & rectification of faults – diagnostic testing, troubleshooting – common practices.	60
4	Soft Tools For Maintenance	40
5	Onsite training – identification of best practices in o & m. Troubleshooting approaches.	60
6	Mini-Project1 : Project concerned with Digital Microwave Equipment,	40
7	Mini-Project1 : Project concerned with Antenna and Outdoor unit system	40
8	Mega-Project1: Project concerned with Satellite communications technology	50
9	Field Visits: This is to be organized on live Microwave system, Satellite earth station, Digital Satellite Phone terminal	50
10	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers.	24
11	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	486

Skill Set

1	Understand the theory of Microwave communications, waveguide propagation
2	Supervise Microwave route, augment and upgrade the system if required
3	Install the tower assembly, ring earth, waveguide ladder, platform
4	Diagnose the trouble and find out the troublemaking component.
5	Understand the best practices in Operation and Maintenance of Microwave communications systems.
6	Use Network Monitoring System for configuration and management of traffic
7	Carry out multiple small assigned projects
8	Carry out project works concerned with satellite communications
9	Simulate the route on computer
10	Make route diagram and block schematic

Microwave Stations

Lab Equipment and Devices required

1	Waveguide, feeder cable, power meter
2	VSWR meter, Spectrum Analyser.
3	Drill machine, Runaway, Ladder
4	Desktop Computer, Printer

BATCH SIZE:20

Microwave Stations

Certificate Level-VI

		Hrs.
1	Best installation & commissioning practices of microwave system components - microwave equipment, power supply system, tower & antenna assembly etc.	80
2	Best Installation & Commissioning Practices of Infrastructure Used at Microwave Site -Waveguide , Tower Foundation, Power Plant, Battery, Earthing, Cabling at New Installation	80
3	Onsite training – best installation & commissioning practices of microwave system components.	80
4	Preparation of check list, block schematic for best installation & commissioning of microwave system – documentation.	80
5	Mini-Project1 : Project concerned with Digital Transmission Equipment,	40
6	Mini-Project1 : Project concerned with Optical Fiber Cable system	40
7	Mega-Project1: Project concerned with Latest Optical transmission technology	50
8	Field Visits: This is to be organized on live optical transmission systems: GPON, EPON, STM-16,DWDM, Network Management System	50
9	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers in the field of transmission	24
10	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	536

Skill Set

1	Use best installation practice for microwave and satellite communications equipment.
2	Use best installation practices for tower foundations, battery, power plant , ring earth etc.
3	Use best installation practices for cable feeder assembly and connectors
4	Use best installation practices for earth station antenna assembly, its foundation and orientation system.
5	Make full documentation of test schedules
6	Make full block diagrams of the equipments and their connectivity along with distribution of traffic
7	Test all the parameters as prescribed in the equipment manual
8	Carry out multiple projects concerned with Microwave communications
9	Carry out big projects adhering to the implementation schedule
10	Interrogate the vendor regarding the attributes of the equipment

Microwave Stations

Lab Equipment and Devices required

	Equipments & Device Required
1	Drill Machine, Spanner Kit, Screw Driver set, Coach Screw, Nut bolts of appropriate size.
2	Ladder, Runaway, Ladder support, Platform, Clamps and Couplers, Lacing Ties.
3	Tower members, Ring Earth. Aviation lights.

BATCH SIZE:20

Microwave Stations

Certificate Level-VII

		Hrs.
1	Installation & commissioning of a new microwave site in accordance with best practices & as per documentation. Theory & hands on.	200
2	Configuration testing : testing of parameters of equipment, power plant – output voltage, discharge test of battery, under -voltage and over current protection testing, earth resistance testing, alarm system testing. Theory & hands on.	200
3	Documentation of installation.	80
4	Mini-Project1 : Project concerned with Digital Transmission Equipment,	40
5	Mini-Project1 : Project concerned with Optical Fiber Cable system	40
6	Mega-Project1: Project concerned with Latest Optical transmission technology	50
7	Field Visits: This is to be organized on live optical transmission systems: GPON, EPON, STM-16,DWDM, Network Management System	50
8	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers	24
9	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	696

Skill Set

	Able to....
1	Completely supervise the supply , delivery , installation and commissioning aspects of digital microwave communications system.
2	Test the parameter of the equipment as per standard test schedule prescribed in the manual.
3	Test the parameters of the battery and power plant, earth resistance,
4	Make full documentation of the tests and commissioned route
5	Plan new equipment, routes as per the traffic congestion demands
6	Routine testing of the antenna gain, VSWR,C/N ratio, Noise temperature of LNA
7	Carry out multiple mini projects on Microwave stations.
8	Carry out big industrial project of commercial importance on live running microwave stations.
9	Complete installation, commissioning of Satellite earth station
10	Frame tender document for procurement of equipment, antenna based on specifications as per the requirement.

Microwave Stations

Lab Equipment and Devices required

1	VSWR meter, Microwave Power Meter, Spectrum Analyzer.
2	Digital Transmission Analyzer, Multimeter, Frequency Meter.
3	Battery of at least 600 Amps, Earth megger, SMPS Power Plant.
4	Drill Machine, Spanner Set, Screw Driver set.
5	Desk top computer, Printer, RJ-11, RJ-45 cable

BATCH SIZE:20

BROADBAND NETWORKS

1. Specialization: `Broadband Networks

Certificate Level - I

		Hrs.
1	Awareness of Telephone exchanges.	20
2	Physical visit of main exchange RLU,RSU, Transmission room, BSC, BTS sites, BB Node etc.	40
3	Awareness of customer premises equipment. Like EPBT, ROSSETT, Splitter, Modem/CPE , computer , Fax machine etc.	40
4	Understanding of O/D cables, Indoor cables, dropwire , jumper wire, OF cable.	30
5	Understanding of MDF , DDF, IDF.	15
6	Understanding of different tools & their usage.	15
7	Computer Fundamentals: Configuration and Customisation of Desktop environment	6
9	Office tools: MS Word	8
10	Office tools: MS Excel	12
11	Office tools: MS PowerPoint	8
12	Internet Concepts: Websites, e-mail,	6
13	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
	Total Vocational Content	206

Skill Set

1	Identify components of telephone exchange, line side and exchange side
2	Identify different types of exchanges like Main Exchange, RLU, RSU, Transmission room.
3	Identify Mobile Master Switching Centre, Base Switching centre, Base Transmitting station.
4	Identify Broadband node, Router, Bridges, Switches.
5	Identify customer premise equipment like EPBT, Rosette, Splitter, Modem/CPE, Fax machine.
6	Identify different types of tools and measuring instruments
7	Pack, unpack of equipment cases
8	Dismantle the installed equipment
9	Type and prepare text in MS word
10	Work in data sheet and power point.

Broadband Networks

Lab Equipment and Devices required

1	Main Tel. Exchange: MDF, DDF, IDF of Exchanges.
2	RLU, RSU, BSC
3	BB Node
4	CPEs, PC with MS Office and Internet connection .
5	All common tools with OSA (punch tool) and rapping gun.
6	First Aid Box.

Batch Size - 30

Certificate Level – II

		Hrs.
1	Understanding of Physical layout of MDF. Like- verticals, Tag blocks, horizontal and vertical frames.	20
2	Understanding of Tag blocks. Line side tag block, exchange side tag blocks.	20
3	Horizontal and vertical expansion of MDF, Fixing of New tag blocks.	20
4	Physical preparation of O/D cable (jelly filled cable) with proper tools.	40
5	Lacing and fanning of O/D cable.	20
6	Identification of the coloured ribbons of 10/20/50/200/400 pair cable.	30
7	Identification of the pairs of different cables.	10
8	Hardware Components of a Computer system: Identify and check status of devices, install new devices	6
9	Operating System and Application Software: Installation and configuration	10
10	Introduction to the components of Computer Networking: Cables, Switches, Routers, WAP	8
11	Practical with UTP Cables:	6
12	Practical in LAN: Finding fault and trouble-shooting	10
13	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
	Total Vocational Content	206

Skill Set

1	Understand Main Distribution Frame-verticals, Tag blocks , horizontal and vertical frames
2	Expand the horizontal and verticals of the tag block in MDF
3	Crimp and wire the MDF on line and exchange side
4	Crimp and wire at the Exchange side
5	Prepare the outdoor jelly filled cable
6	Lace and fan the outdoor cable
7	Identify the pairs of different cables
8	Understand the components of desk top computer
9	Under stand local area network
10	Understand basic unix commands

Broadband Networks

Lab Equipment and Devices required

1	MDF with tag blocks
2	jumper wire ,VF Cable (Indoor), Jellyfilled cable (outdoor) of 10,20,50,100 pairs, UTP Cable
3	common tools alongwith cable stripper, lacing thread
4	Routers, LAN Switches, UTP Cable
5	First Aid Box.

Batch Size - 30

Certificate Level - III

		Hrs.
1	Physical preparation of I/D VF cable.	40
2	Lacing and fanning of the I/D cable.	40
3	Identification of the colour ribbon of I/D cable.	40
4	Identification of the pairsof ID cables.	40
5	Termination of O/D Cable on lineside tagblock of MDF.	40
6	Termination of I/D cable on exchange side tagblock of MDF.	40
7	Testing of continuity of pairs by buzzer/tester.	40
8	Identification of Power supply AC&DC and lacing procedure of power cables.	20
9	Earthing	10
10	Internet: Services available	6
11	Database Management Tool and Applications	10
12	Information to HTML & XML	10
13	Website designing	10
14	Societal impacts of IT	4
15	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 3 hours)	9
	Total Vocational Content	359

Skill Set

1	Prepare indoor V/F cable
2	Identify colors in ribbons of the cable,
3	Terminate of the outdoor cables in the exterior tagblock
4	Terminate of the indoor switchboard cable in the interior tagblock
5	Test of continuity of pairs
6	Make pit earth and with the use of copper plate provide earthing arrangement
7	Understand the power cabling the necessity of three wires and power conversions
8	Understand the services of internet and use them
9	Understand data base management system, HTML,XML
10	Design the website

Broadband Networks

Lab Equipment and Devices required

1	MDF with tag blocks
2	jumper wire, VF Cable (Indoor) , Jellyfilled cable (outdoor) of 10,20,50,100 pairs , UTP Cable
3	common tools alongwith cable stipper, lacing thread
4	Routers , LAN Switches, UTP Cable
5	Digital multimeter with buzzer facilities
6	Power palnt
7	earth location, earth megger
8	PC with concerned software
9	First Aid Box.

Batch Size - 30

Broadband Networks

Certificate Level - IV

		Hrs.
1	Identification of NE/TEN/ Subscriber port on MDF.	30
2	Identification of dial tone and telephone No. working on pair.	40
3	Testing of cable pair in O/D by tester.	40
4	Understating of line parameter and their tolerable limits.	40
5	Practice of jumping at MDF.	40
6	Preparation of end connectors with the help of machine for equipment like DSLAM.	50
7	Termination of I/D VF Cable on tag block meant for DSLAM.	40
8	Understanding of different alarms at the CPE at customer premises.	20
9	Advanced Computer Networking: Configuration of router, Unix commands, Protocols used in each layer of OSI,IP addressing , IPV-4 and IPV-6 basics	50
10	Mini-Project1 : Project concerned with Broadband Equipment like DSLAM , OCLAN	20
11	Field Visits: This is to be organized on live Equipment like Router, Switches, NMS etc	12
12	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	394

Skill Set

1	Locate subscriber line on the line cards of exchange and on MDF tag block
2	Segregate the pairs of Individual subscriber
3	Test subscriber line parameters
4	Crimp and Jumper at Main Distribution Frame(MDF)
5	Prepare cable connectors used in Data networking
6	Restore faults at Customer Premise Equipment
7	Configure Customer Premise equipment as per customer need
8	Use Unix commands,Protocola used in OSI Layers
9	Understand IP-4 and IPV-6
10	Carry out small project on DLSAM or OCLAN or other such vital elements of Broadband communications

Lab Equipment and Devices required

1	Main Tel. Exchange.
2	RLU, RSU,MDF with exchange side and line side tag blocks
3	jumper wire, VF Cable (Indoor)
4	common tools alongwith cable stripper, lacing thread
5	Receiver
6	punching tool, machine for making connectors
7	CPEs
8	Routers, LAN Switches, OCLAN, DSLAM, NMS Terminal
9	First Aid Box.

Batch Size - 30

Certificate Level - V

		Hrs.
1	Physical identification of different DSLAMs of different vendors.(+theory)	30
2	Identification of the capacity of DSLAM.	12
3	Understanding of OF Cable, pigtail, optical patch chord, optical port, electrical port.	50
4	Understanding of termination of line side port & exchange side port.	20
5	Physical installation of DSLAM & extension of alarm/ power supply.	40
6	Lacing and fanning of I/D cable leading to MDF.	40
7	Identification of subscriber card, splitter card & control card.	50
8	Understanding floor plan for new installation	40
9	Mini-Project1 : Project concerned with Data communications , IPV-4,	40
10	Mini-Project 2 : Project concerned with Router configurations	40
11	Mega-Project1: Project concerned with Latest in data communications	50
12	Field Visits: This is to be organized on live routers, switches, bridges.	50
13	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers	24
14	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	498

Skill Set

	Able to....
1	Configure DSLAMs of different vendor make
2	Use pigtails, patch cords, optical attenuators, electrical ports
3	Install DSLAM Equipment
4	Extend alarm and power cable to the equipment
5	Make floor plan for new installation
6	Make check list of tests
7	Make block schematic of the network showing bridges, routers etc
8	Carry out small projects on IPV-4 and IPV-6
9	Carry out major project on application part of IPV-6, routers, bridges,
10	Understand specs and query vendors for necessary modifications as the case may be

Broadband Networks

Lab Equipment and Devices required

1	Main Tel. Exchange.
2	RLU, RSU, MDF with exchange side and line side tag blocks
3	jumper wire, VF Cable (Indoor)
4	common tools alongwith cable stipper, lacing thread
5	Receiver
6	punching tool, machine for making connectors
7	CPEs
8	Routers, LAN Switches, Bridges, OCLAN, DSLAM, NMS Terminal
9	OF Cable, OF patch chord, OF pig tail
10	First Aid Box.

Batch Size - 20

Broadband Networks

Certificate Level - VI

		Hrs.
1	Accessing of DSLAM with consol cable.	60
2	Understating of IP Address, LAN, VLAN.	60
3	Understating of Ethernet, ATM Frames.	60
4	Understand the configuration of ADSL Port.	60
5	Configuration of CPE at customer premises.	60
6	Mini-Project1 : Project concerned with MPLS-VPN	40
7	Mini-Project2 : Project concerned with MLLN	40
8	Mega-Project1: Project concerned with IPV-6 applications	50
9	Field Visits: This is to be organized on live IPV_6 switches	50
10	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers	24
11	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	516

Skill Levels

1	Understand IP address, LAN and VLAN
2	Understand Ethernet and ATM frame
3	Dictate various services available in MPLS-VPN, MLLN etc
4	Reconfigure the customer premise equipment in case more bandwidth or other service is required.
5	Plan the broadband network as per customers specific requirement
6	Optimize the utilization of equipment keeping cost fact in mind
7	Upgrade the network with minimum additional switches and routers
8	Understand carrier ethernet and IP over transmission network.
9	Understand and explain how packet traffic can be integrated with conventional NG SDH and OTN network

Broadband Networks

Lab Equipment and Devices required

1	BB CPEs
2	Routers, LAN Switches, Bridges, OCLAN, DSLAM, NMS Terminal
3	Consol Cable
4	ATM Switch
5	Media convertor
6	MPLS Lab Setup
7	MLLN Lab Setup alongwith CPEs
8	First Aid Box.

Batch Size - 20

Certificate Level -VII

		Hrs.
1	ADSL overview & BB network components	50
2	Understanding of Media convertor.	30
3	Understanding of cable connectivity at Tier-II switch.	30
4	Understanding of different types of card installed in Tier-II switches.	50
5	Understanding of different types of ports available in Tier-II.	50
6	Understanding of connectivity of Tier-II to Tier-I and further to BRAS.	60
7	Awareness of different alarms and Troubleshooting.	40
8	Functions of various servers of BB network	80
10	Function of NOC/BRAS,DR	80
11	Mini-Project1 : Project concerned with VPN	40
12	Mini-Project2 : Project concerned with VLAN, MLLN, IP over MPLS	40
13	Mega-Project1: Project concerned with Latest trends in data communications	50
14	Field Visits: This is to be organized on live routers, switches, bridges, tunnels etc.	50
15	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers	24
16	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 6 hours)	18
	Total Vocational Content	692

Skill Set

1	Understand ADSL and its components
2	Understand Media Convertor, cable connectivity to tier-II switch
3	Understand different types of cards in tier-II switch
4	Understand connectivity of tier-I to tier-II and further to BRAS
5	Understand the functions of BRAS, NOC and DR etc
6	Plant new network exclusively based on IPV-6
7	Reroute the traffic through NMS in case of trouble or congestion
8	Alter the parameters of IP switch to suit the customer needs
9	Carry out small projects in VPN, IP over MPLS
10	Carry out mega projects in IP tax, OTN etc.

Broadband Networks

Lab Equipment and Devices required

1	BB CPEs
2	Routers, LAN Switches, Tier-I, II, BRAS, OCLAN, DSLAM, NMS Terminal
3	Consol Cable
4	ATM Switch
5	Media convertor
6	MPLS Lab Setup
7	MLLN Lab Setup alongwith CPEs
8	First Aid Box.

Batch Size - 20

OPTICAL FIBER NETWORK

1. Specialization: Optical Fiber Network

Certificate Level -I

		Hrs.
1	Identification of Optical Fibre System Basics- MDF/DDF/FDF/FDMS/Copper Cables OF Cable/ RF Cables,	26
2	Identification of different types of OFC equipment systems.	26
3	Identification of Measurements Meters-computer, monitor, printer Different types of Optical Power Meter, Light Source etc	26
4	Identification of Measurements Meters accessories: Optical power meter, OSA, ONT-30, Spectrum Analyser, SDH analyser, BER tester, Digital transmission analyser	26
5	Identification of Duct laying accessories: Soil strata, Surface Trenching, duct laying ,HDPE/PLB Duct, other pipes, Joint Closure etc	24
6	Identification of Optical Fibre Cable and Accessories -Identification of cable of one vendors and colour coding scheme of single fibre. FCPC, SCPC connectors, WSC,FDF, pigtails. Heat shrinks.	26
7	Identification of Measuring/testing Instruments and Accessories: Optical Power Meter, Fixed/variable Attenuator, Fixed/variable Attenuator, Patch cord, pig tail, connectors, Different types of Splitters, coupler, combiner. Splicing machines of different types. Light Source, Patch cord connectors, Different types of Splitters, OTDR, Splicing Machines for different types of of cables. Optical Spectrum Analyser, Optical pads	26
8	Computer Fundamentals: Configuration and Customisation of Desktop environment	6
9	Office tools: MS Word	8
10	Office tools: MS Excel	12
11	Office tools: MS PowerPoint	8
12	Internet Concepts: Websites, e-mail,	6
13	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
	Total Vocational Content	226

Optical Fiber Network

Skill Set

1	Eject and insert cards under supervision.
2	Understand the alarm due to low power/high power, thus can assist the technician
3	Check card health status, major, minor alarms recognition and corrective action
4	Observing the status of Network Element in Local craft terminal(LCT),able to carry out local shifting of the equipment
5	Unpacking of the material
6	Assistance for Operation of the equipment
7	Card repair and replacement management.
8	Respond to remote stations demands like giving loop/break etc.
9	Card health status monitor.
10	Maintenance of appropriate temperature and humidity in the Equipment room.
11	Understand the basic concepts of configuration and customisation of desktop environment
12	Get acquainted with the office tools for word processing, spreadsheets and presentation
13	Recognize various internet applications

Lab Equipment and Devices required

1	MDF/DDF/FDF/FDMS, Copper cables, OF cable, RF cable.
2	OLTE, STM-1/4/16,DWDM,FTTH: COT & ROT.
3	Optical Power meter, Light source, OTDR.
4	OSA, ONT-30, Spectrum Analyser, SDH analyser, BER tester, Digital transmission analyser
5	HDPE duct, PLB duct, Joint Closure, RCC pipes, GI pipe
6	WSC, Pads,Pigtails and different types of connectors like FCPC, SCPC, patchcords.
7	Variable attenuator, Fixed attenuator, Splitters, Couplers, Combiners, Splicing machine, Splicing machine for ribbon cable.
8	Desktop PCs
9	MS Office software
10	Internet Connectivity
11	MS Windows OS
12	Cables: UTP, OFC
13	LAN Switch
14	Router
15	WiFi Access Point
16	Crimping Tool & LAN Tester
17	MS Access / MS SQL Server software

BATCH SIZE:15

Optical Fiber Network

Certificate Level –II

		Hrs.
1	Familiarization with office equipments: Usage of FAX, Photocopy machine, Printer, scanner, basic word & excel file usage in computers, Typing in computer	28
2	Familiarization with Measurements accessories: Fixed/variable Attenuator, Patch cord connectors, Different types of Splitters, coupler, combiner, Crimping tool for wiring at DDF, Lacing ties. Demonstration of installation practices	28
3	Familiarization with Optical Fibre System along with the demo on systems- Understanding Station alarm of different system and causes (critical, major, minor), Minimum and Maximum Trans and receive powers of different systems. Measurement of Power through power meter, and basic functioning of OTDR(Optical Time Domain Reflect meter).	28
4	Familiarization with meters used in Optical Fiber System- Optical Power Meter, Light source, Detector, Optical Talk Set, OTDR, OSA(Optical Spectrum Analyser), DTA(Digital Transmission Analyser) set, Splicing Machines for ribbon fiber and normal fiber, SDH Analyser, Jitter Analyser.	28
5	Familiarization with different types of systems: understanding the commonalities and point of difference in different type of optical systems, Elementary procedures for installation of the system as per procedures.	28
6	Familiarization with different vendor OFC: Identification of cable of different vendors and understand the colour coding scheme of Single/Ribbon fibre.	20
7	Familiarization with Laying Material- Information regarding HDPE/PLB Duct, Fiber Joint Closure, Pre-cast Chambers, route markers	20
8	Understanding Manual Works and Machine Laying works in OFC laying - Surface Trenching, duct laying & backfilling, basics of trench less Method of OFC laying.	28
9	Familiarization of different Measurements taken during Cable laying works: Depth of the pipe from the surface in different strata and built-up areas. Ratio of cement, concrete, bazi and irons parts in reinforced embankments. Measurements of total fibre and cable length. Duct integrity test.	12
10	Hardware Components of a Computer system: Identify and check status of devices, install new devices	6
11	Operating System and Application Software: Installation and configuration	10
12	Introduction to the components of Computer Networking: Cables, Switches, Routers, WAP	8
13	Practical with UTP Cables:	6
14	Practical in LAN: Finding fault and trouble-shooting	10
15	Examination (practical and theory) at the end of 3rd month , 6th month and at	6

	the end of the session (Each exam will be of 2 hours)	
	Total Vocational Content	266

Optical Fiber Network

Skill Set

1	Able to identify faulty unit/card.
2	Able to measure input DC voltage at the equipment.
3	Able to measure earth resistance.
4	Capable to measure Optical Power at the relevant port.
5	use spanner set, drill machine , lacing ties , gatties, lugs, tapes etc.
6	Switch on and Switch off the Engine alternator.
7	Use batteries optimally till -46 V
8	Physical placement of the equipment inside the room as per the approved drawing
9	Ensure that equipment is placed as per the recommended orientation of the manufacturer/ approved drawing.
10	Assemble the desk top computer, install the operating system
11	Recognise various components of computer systems
12	Understand the basic concepts and configurations of Operating System and application software
13	Get acquainted with components of networking

Optical Fiber Network

Lab Equipment and Devices required

1	Fax Machine, Photocopier Machine, Printer, Scanner,
2	Variable attenuator, Fixed attenuator, Splitters, Couplers, Combiners, Crimping tool, Laces for wiring at DDF.
3	OLTE, STM-1/4/16, DWDM, FTTH: COT & ROT, Power Meter, OTDR.
4	Light Source. Optical Detectors, Optical Talk Set, Optical Spectrum Analyser, Digital Transmission Analyser. Splicing Machine, SDH analyser
5	OF cable pieces of different vendors.
6	HDPE / PLB duct, Joint Closure, Precast Chambers and Route markers.
7	Desktop PCs
8	MS Office software
9	Internet Connectivity
10	MS Windows OS
11	Cables: UTP, OFC
12	LAN Switch
13	Router
14	WiFi Access Point
15	Crimping Tool & LAN Tester
16	MS Access / MS SQL Server software

BATCH SIZE:15

Optical Fiber Network

Certificate Level -III

		Hrs.
1	Functioning of power support infra: understanding the functioning of SMPS power plant, Various capacity of modules , Extension of DC cable to the equipment , DCDB, Trickle charging of the battery. DC to DC convertor, Float rectifier, Automatic Voltage Regulators, Different earthing techniques like pit earthing and ring earthing.	28
2	Functions of Passive Telecom support equipment: –Function, application and Wiring area of MDF/DDF/FDF/FDMS, splitters, connectors, Pigtails and patch cords	36
3	Functioning of different meters-. Functioning of different meters- Optical Power Meter, Light source, OSA(Optical Spectrum Analyser, SDH analyse, Jitter tester	104
4	Functioning of Optical Systems: Station advances alarm Identification of different systems and causes and fault analysis and removal - LOS, OOF, LOF, B1 Error, MS-AIS, B2 Error, MS-RDI, MS-REI, AU-AIS, AU-LOP, HP-UNEQ, HP-TIM, HP-SLM, HP-LOM and lower order alarm etc	40
5	Survey of Optical Fibre Cable route – Soil strata delineation, Marking of culverts, bridges, dry nallahs, road/rail crossings etc. Type of protection recommended according to specs	24
6	HDPE Duct Laying Functions: Micro tunnelling, Manual trenching, Trenching through JCB, laying of duct, Jointing of ducts, Preparation of main holes, Duct integrity test. Horizontal Directional Drilling techniques	40
7	Functionalities in OF cable laying process :Laying of cable. Splicing, Preparation of closure: Loading of fibre in splice tray in recommended shapes. Mounting of splicing closure in main hole. Termination of fibres in FDF. End to end testing of cable in FDF.	24
8	Energy Conservations & Management: Proper scaling of SMPS modules, Energizing of SMPS: by AC mains and Gen Set. Storing of backup in secondary cells (Proper rating of batteries). During power failures secondary cells back up to be used till terminal voltage drops to -46 V, only after that Engine alternator to be started. Timely change of filters in E/A, Maintenance of Dynamo and cells in proper functioning conditions.	12
9	Internet: Services available	6
10	Database Management Tool and Applications	10
11	Information to HTML & XML	10
12	Website designing	10
13	Societal impacts of IT	4
14	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 3 hours)	9
	Total Vocational Content	357

Optical Fiber Network

Skill Set

1	Understand parameters of the equipment and testing and measuring instrument .
2	Calibration of the testing instrument depending on say temperature, ampere, voltage and watts
3	Connect measuring instrument on testing points of the equipment.
4	Make relevant adaptable connectors both straight connectors and cross connectors as per the requirement
5	Comprehend the tolerance of the battery set and its DC current capacity
6	Optimum use of free cooling system to reduce AC usage
7	Testing of voltage levels at each stage right from battery to DCDB to the equipment ports.
8	Measurement of varoius parameters with testing instrument/tool.10. Operate the equipment under optimum condition.
9	Creating and deleting the subscriber in the exchange.
10	Optimal use of energy saving devices.
11	Restoration of fault conditions under the guidance from supervisor
12	Be aware of the services available in Web and internet
13	Get acquainted with Database Management Tools
14	Explain the techniques of designing of websites.

Optical Fiber Network

Lab Equipment and Devices required

	Equipments & Device Required
1	SMPS power plant of 25/100 Amps, DCDB, Automatic Voltage Regulator, Float rectifier.
2	MDF, DDF, FDF, FDMS, Splitters , Connectors, Pigtails and Patchcords.
3	Optical Power Meter, Optical Detectors, Optical Talk Set, Optical Spectrum Analyser, Digital Transmission Analyser. Splicing Machine, SDH analyser
4	OLTE, STM-1/4/16, DWDM, FTTH: COT & ROT.
5	Rodometer, RCC Pipe , GI pipe
6	HDPE / PLB duct, Joint Closure.
7	Splicing Machine
8	Battery set, Engine Alternator, Fuel Tank
9	Desktop PCs
10	MS Office software
11	Internet Connectivity
12	MS Windows OS
13	Cables: UTP, OFC
14	LAN Switch
15	Router
16	WiFi Access Point
17	Crimping Tool & LAN Tester
18	MS Access / MS SQL Server software

BATCH SIZE:15

Optical Fiber Network

Certificate Level -IV

		Hrs.
1	Operation and Maintenance of Power Plant: Measurement of Power drop between Battery to Equipment,, Setting the input voltage to battery through SMPS, Identification of faulty SMPS Modules. Removal of faulty cells from the battery set, Use of two battery sets together to increase the DC current capacity. Routine Battery charging discharging, Check list for day to maintenance, Routine charging discharging of the battery. Change of Engine oil, lubricants and filters.	44
2	Operation and Maintenance of different type of systems used in telecommunication: PDH/SDH/DWDM/GPON/DXC /MADM.	40
3	Operation and Maintenance of OFC route or SDH ring or interconnected ring, Dynamic capacity management, Remote monitoring, Router management, Pinging.	32
4	Operation and Maintenance of Route party against specific route KMs. AC vehicle for splice, normal vehicle for patrolling, proper upkeep of Splicing Machine, OTDR, Talk set. Provision of shovel, spikes, water pump, tool kit in the splicing van.	36
5	O&M and its Documentation: Documentation of cable route : Marking of route indicators, joint indicators, Branch joint indicators, Low depth areas, comprehensive route index diagram with proper demarcation of nallah bridge culverts etc.	40
6	O&M : Patrolling of the route for possible breaks at least twice in every week , bends, loss of concrete on the reinforced GI pipe over the bridges and culverts. Proper watch on other operator's activities regarding cable laying on the same side of the road, proper watch on PWD and NHA activity regarding road expansion.	24
7	O&M of the Fibre: Daily check up of fibre length for any breakage or increase of splice loss in some joints through OTDR. Fibre usage records and availability of dark fibre. Identification of the faulty fibre and its rectification.	24
8	Maintenance/restoration methods –Restoration of cable fault by way of making joints and restoration of OFC route.	24
9	O&M of Spicing Machine & accessories: Timely replacement of Electrodes, Keeping adequate quantity Heat shrinks, mirrors. Splicing techniques for ribbon fibre, concept of splicing machine, different types of joints and jointing techniques, splicing Van maintenance.	32
10	Advanced Computer Networking: Configuration of router, Unix commands, Protocols used in each layer of OSI,IP addressing , IPV-4 and IPV-6 basics	50
11	Mini-Project1 : Project concerned with Optical Fibre communications	20
12	Field Visits: This is to be organized on live optical transmission systems: GPON, EPON, STM-16,DWDM, Network Management System	12
13	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
14	Examinations	9

*Optical Fiber Network***Skill Set**

1	Carry out routine day to day maintenance: for instance checking of Engine oil level, lubricants, change of oil filters etc.
2	Prepare checklist of the jobs needed to carry out periodically for sustenance of equipment/instrument/material/route.
3	Operation of Power plant, Network Management System in Transmission .
4	Dynamic Capacity Management in big transmission Network.
5	Periodic Check up of say AC plant/Engine Alternator etc
6	Route checking for possible faults.
7	Diagnose the fault type and take corrective action
8	Carry out OF cable joints and placing the joint in joint closure
9	Make complete documentation of cable route and system kilometres
10	interpret the IP address and basic of Internet Technology

Lab Equipment and Devices required

1	SMPS power plant of 25/100 Amps, Two battery sets each with atleast 400 AH. Engine alternator of atleast 15 KVA capacity.
2	Atleast two terminals of STM-1/4/16 , DWDM, GPON, DXC, MADM
3	Optical Power Meter, Optical Detectors, Optical Talk Set, Optical Spectrum Analyser, Digital Transmission Analyser. Splicing Machine, SDH analyser
4	Route Indicator, Joint Indicator, Joint Closures, Rodometer
5	Splicing Machine, Heat Shrinks, OFC tool kit.
6	IPV-6 Lab

BATCH SIZE:15

Optical Fiber Network

Certificate Level –V

		Hrs.
1	Supervision of the routine operation of Engine Alternator: Change over functions: Consumption of oil vis a vis load for a particular capacity. Keeping run hour meter in healthy condition, Change lubricants and filters in time. Change of Engine batteries in time.	40
2	Supervision of infrastructures related to safety in the equipment room/building: Complete understanding of the fire fighting equipment, Fire alarms extension, smoke detection, placement of static class B and C fire extinguisher at vulnerable places in the building, training of the lower staff regarding usage of fire fighting equipment, routine fire drills.	40
3	Supervision of Optical Fibre Transmission Equipment-Fault restoration methods in different type of system SDH/DWDM/GPON/DXC /MADM. Understanding the software and hardware working of each of the OF equipment for ease in pinpointing the faulty card or faulty station.	40
4	Supervision of Remote stations through NMS: Operation of local craft terminal, Guidance to remotely stationed technicians to set right the errors and alarms, Ensuring service availability as per service level agreement. Understanding the configuration on the NMS and able to alter in case of requirement	40
5	Supervision of transmission route- Equipment testing& measurement through near end/far end loop back and measurement through local craft terminal, DTA set and SDH analyser, Liaising with the local PWD, NHAI authorities to avoid destruction of the of route. prepare the agenda for monthly meet with the local administration for protection the underground public utility of which of cable is also an important part.	40
6	Supervision of cable routes: Theory part: –Optic theory, advantages and applications of cable, light propagation, nature of light, total internal reflection, scattering, attenuation, distortion. Fibres recommended by ITU, New propriety fibres, Ribbon fibre and its deployment, Laser , EDFA, dispersion compensation.	32
7	Supervision of Cable route: Practical Part: -By way of using OTDR meter, Power Meter, Optical Source, optical talk set, splicing machine ; checking of the route is done at fixed time interval. Interpretation of the final route index diagram for locating the environs of the fault location. Making of route parties. Keeping the vehicles for route party in good condition. Route party's portable engine alternator maintenance, optical fibre cable route optimization, supervision of duct integrity test.	32
8	Mini-Project1 : Project concerned with Digital Transmission Equipment,	40
9	Mini-Project2 : Project concerned with Optical Fibre Cable system	40
10	Mega-Project1: Project concerned with Latest Optical transmission technology	50
11	Field Visits: This is to be organized on live optical transmission systems: GPON, EPON, STM-16,DWDM, Network Management System	50

Optical Fibre Networks

		Hrs
12	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers	24
13	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
Total Vocational Content		480

Skill Set

1	Locate the trouble area and should be able to resolve the same.
2	Oversee the installation of the equipment/laying of cable .
3	Suggest corrective measures for extracting optimum performace of the system.
4	Control over the performance of the equipment with the help of vendor.
5	Configuration of route and traffic management in Network Management System
6	Wiring of STM-4/16, MADM, DXC
7	Operation of Optical Spectrum Analyser, Advanced Network Tester, Wavelength meter, Digital transmission analyser
8	Connecting rings through Digital Cross Connect and configuration in NMS,
9	Install and operate DWDM system and carry out configuration of the traffic
10	Operate fire safety measures

Lab Equipment and Devices required

1	Engine alternator of atleast 15 KVA capacity.
2	Fire fighting system with alarms and smoke detection facility
3	Digital Transmission Analyser.Splicing Machine, SDH analyser.
4	Atleast two terminals of STM-1/4/16 , DWDM,GPON,DXC, MADM
5	Optical Power Meter, Optical Detectors, Optical Talk Set,Optical Spectrum Analyser, Digital Transmission Analyser.Splicing Machine, SDH analyser

BATCH SIZE:15

Optical Fibre Networks

Certificate Level –VI

		Hrs.
1	Best installation practices in Optical Fibre Telecom Equipments - Levelling, runaway, cable lacing, dressing, Fixing of the coach screw, Cable management in WSC , Fibre management in FDF, Making figure of 8 inside the Joint box . Wiring at DDF and equipment with crimp tool. extension of the battery voltage with minimum drop through DCDB. Order wire testing, Rx power testing, Link design, fade margin.	40
2	Best installation practices for earthing: Pit Earthing with copper plate, Ring Earth, chemical earthing for rocky areas.	24
3	Best installation practices for battery and power plant: Keeping the battery in vertical direction, providing solid base, serial adding the battery with copper plates and connectors , extending the voltage of the battery through lugs towards DCDB. Measurement of the initial charge and further charging-discharging to know the health of the battery before installation .	40
4	Best installation practice for Engine alternator: Providing the platform, making the E/A base vibration resistant. Keeping the installation site outside the building, providing Engine shed. Use of precipitator to avoid fly ash and carbon soot, Fixing of run hour meter and battery.	48
5	Best installation practice for computer and accessories: Installation of computer, Server, LAN,WAN,UPS, loading of the window software, loading of the anti-virus devices, loading of the LCT or NMS software, Keeping spare parts for routine maintenance. Changing the hardisk capacity of the computers, de-installation and installation of the computer in all respects. Assembling of the computers from its individual hardware components.	40
6	Best Installation Practices: Comparison of laying practices by different operators, Multiple duct laying, NHAI's common communication duct, Hydraulic and Pneumatic pulling techniques. Trench less trenching within the road, Manual and Machine boring, Overhead OFC laying	40
7	Detailed HDD Installation practice: HDD basics, effect of soil on HDD, Advantages of trench less method, planning, process ,operation drilling, reaming of HDD and OFC blowing in the laid duct. and fusion splicing	24
8	Type of Optical Fibres: G652,G653,G654,G655 and other propriety fibres.	24
9	Information and uses-regarding pigtail, patch cords, wall splice closure, fibre management system, DDF/FDF/ODF/FDMS	20
10	Practical tasks -connection in FDF from WSC and FDF to OLT/termination station/GPON NE	20
11	Practical tasks - Fusion splicing methods, FDF/FDMS	20
12	Practical tasks - End to end testing method by using (i)stabilized laser source and high optical power meter (ii)optical time domain reflector meter	20
13	Mini-Project1 : Project concerned with Digital Transmission Equipment,	40
14	Mini-Project2 : Project concerned with Optical Fibre Cable system	40
15	Mega-Project1: Project concerned with Latest Optical transmission technology	50

Optical Fibre Networks

		Hrs.
16	Field Visits: This is to be organized on live optical transmission systems: GPON, EPON, STM-16,DWDM, Network Management System	50
17	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers in the field of transmission	24
18	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	576

Skill Set

1	Make comparative statement regarding the parameters of equipment of different vendors.
2	Use the latest trends in installation and commissioning of the equipment and cable.
3	Understand specification of the equipment, Cable Testing instruments etc
4	Installation of the equipment, laying of the cable in a professional manner as per standard specification.
5	Apply corrective measures in case the parameter is partly deviated from specifications.
6	Splicing in Way Side Cable, Jumpering at Fibre Distribution Frame.
7	Carry out Horizontal Directional Drilling
8	Differentiate between the type of fibre from the point of view of their attenuation and dispersion.
9	Installation of Fibre to the home equipment in Exchange and in Customer's home/office
10	Repair minor faults in SMPS module

Lab Equipment and Devices required

1	Way Side Cable, FDF,FMS,Crimp tool
2	Copper Plate for pit earthing.
3	At least two sets of 400 AH battery, 25/100 Amp SMPS power plant, DCDB.
4	Engine alternator of at least 15 KVA capacity.
5	Atleast two terminals of STM-1/4/16 , DWDM,GPON,DXC, MADM
6	Optical Power Meter, Optical Detectors, Optical Talk Set,Optical Spectrum Analyser, Digital Transmission Analyser.Splicing Machine, SDH analyser
7	Computer , Server, LAN, WAN, UPS.
8	HDPE/PLB duct, Over Head OFC cable

BATCH SIZE:15

Optical Fibre Networks

Certificate Level –VII

		Hrs.
1	Installation and commissioning of new Optical Transmission Systems: Testing of the equipment as per the AT procedure, Making AT report, Making Block Schematic, Network Diagram, Route index diagram. Wiring in the equipment side and the DDF. Wiring at the equipment side and the FDF and WSC. Making configuration of all NE's in the NMS.	60
2	Physical installation of System terminal including back panel cabling & connection i.e SDH & NG SDH/ DWDM.	36
3	Physical installation of System terminal including back panel cabling & connection i.e GPON/DXC/MADM	36
4	Theory part of the Optical fibre Telecom Equipment: Basics of PDH, SDH, DWDM, FTTH and OTN equipment	100
5	Estimate and Tender Preparation: Preparation of Project Estimate, Detailed Estimate, Preparation of the tender documents, Understanding the tender conditions, Presentation of the tender, Preparation of the comparative statement of the bidder, Pre-bid, post bid analysis, Preparation of activity chart, implementation schedule.	30
6	Installation, Commissioning of the Optical Fibre Cable: Testing of the Fibre length, Losses, Loss of splice, Number of Splices per 2 KMs, Losses at 1310 Nm and 1550 Nm, Difference between route Kms and Fibre length, Requisite number of Route indicators at each pulling point and turns, Joint Indicators, Testing of the specification of the Joint Chamber, WSC, FDF, Losses in the joint at WSC, connector losses at FDF, Air pressure test for ducts etc as per approved acceptance test procedures.	40
7	Making of Final Route Index diagram of the commissioned cable: showing landmarks, points of zero depth, culverts and bridges crossings, rail/road crossings. Joint Indicators, distance from the centre of the road. Average depths for each 100 meter section.	40
8	Permission from the landowning agencies: Like PWD, NHAI, Railways, Forest Department. Municipalities. Keeping the documentation of the permission. Keeping record of backfilling and reinstatement and certificate from the owning agency.	20
9	Basic concepts of Transmission signals: PCM principles, higher order multiplexing, Line coding, SDH basic concepts, SDH in rings, Protection features, Performance Parameters, Link Engineering, Rise time budget.	60
10	OF cable network accessories- regarding pigtail, patch cords, wall splice closure, fibre management system, DDF/FDF/ODF/FDMS, Basic concept of splitter and losses due to them.	46

Optical Fibre Networks

		Hrs.
11	Estimate and Tender Preparation: Preparation of Project Estimate, Detailed Estimate, Preparation of the tender documents, Understanding the tender conditions, Presentation of the tender, Preparation of the comparative statement of the bidder, Pre-bid, post bid analysis, Preparation of activity chart, implementation schedule	26
12	Mini-Project1 : Project concerned with Digital Transmission Equipment,	40
13	Mini-Project2 : Project concerned with Optical Fibre Cable system	40
14	Mega-Project1: Project concerned with Latest Optical transmission technology	50
15	Field Visits: This is to be organized on live optical transmission systems: GPON, EPON, STM-16,DWDM, Network Management System	50
16	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers in the field of transmission	24
17	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 6 hours)	18
	Total Vocational Content	716

Optical Fibre Networks

Skill Set

1	Carry out installation and commissioning of the new equipment, cable.
2	Carry out all the tests mentioned in the approved acceptance testing schedule from authentic agency.
3	Prepare Acceptance testing report including deviations and the justifications thereof.
4	Carry out the configuration management in Computer as the case may be.
5	Prepare final schematic diagram/Cable diagram/Route index Diagram/Equipment configuration diagrams like rings/mesh/star or complex networks
6	Installation, testing as per procedures, commissioning of the equipment
7	Full documentation of the commissioned plant, equipment, engine, cable route, network etc like Block schematic of the network, route index diagram, traffic handling capacity and loading chart etc.
8	Carry out subscriber creation, deletion, and grant/withdrawal of facilities through network management system
9	Traffic management in transmission rings, like adding new NE, configuration on the NMS.
10	Up gradation of traffic chart ,
11	Make Cable route diagram in soft copy format.
12	Maintain the specified charging and discharging of the battery
13	Change of lubricants and filters in Engine as per guidelines
14	Keeping Engine run hour meter in working condition and taking readings in a register regularly.
15	Distributing the Engine load in a manner that only equipment and apparatus as well as minimum ACs gets power from engine.
16	Create an environment where Switching off unnecessary lights and fans, use of CFL become part of habit
17	Routine testing of cable every week

Lab Equipment and Devices required

1	Way Side Cable, FDF,FMS,Crimp tool
2	Copper Plate for pit earthing.
3	Engine alternator of at least 15 KVA capacity.
4	Atleast two terminals of STM-1/4/16 , DWDM,GPON,DXC, MADM, NGSDH
5	Optical Power Meter, Optical Detectors, Optical Talk Set,Optical Spectrum Analyser,Optical Time Domain Reflectometer, Digital Transmission Analyser.Splicing Machine, SDH analyser

BATCH SIZE:15

TELECOM SOLUTION FOR CORPORATE AND BUSINESS HOUSES

1. Specialization: Telecom Solution for corporate and business houses

Certificate Level - I

		Hrs.
1	Computer Fundamentals: Configuration and Customisation of Desktop environment	6
2	Office tools: MS Word	8
3	Office tools: MS Excel	12
4	Office tools: MS PowerPoint	8
5	Internet Concepts: Websites, e-mail,	6
6	Network element Identification: Primary , secondary, and Distribution cable	30
7	Jointing kits identification i.e. different type used for different size of cables and jointing tools identification	30
8	Cable Identification: Switch Board , Jelly Filled, Drop wire, Jumper wire etc.	30
9	Outdoor Equipment Familiarisation: Identification of Pillar, cabinets and various type of DPs.	40
10	Computer Fundamentals: Configuration and Customisation of Desktop environment	6
11	Office tools: MS Word	8
12	Office tools: MS Excel	12
13	Office tools: MS PowerPoint	8
14	Internet Concepts: Websites, e-mail,	6
15	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
	Total Vocational Content	216

Skill Set

1	understand the basic concepts of configuration and customisation of desktop environment
2	get acquainted with the office tools for word processing, spreadsheets and presentation
3	recognise various internet applications
4	To understand the basic elements of outdoor network including underground cable.
5	To get familiarized with different type of underground cable including jointing kits.
6	To get familiarized with different DPs, Pillar and cabinete.

Lab Equipment and Devices required

1	Different size and type of underground cable
2	Different type of jointing kits and cable jointing tools
3	Different type of PBC switch board cable, Drop wire, Jumper wire
4	Different size and type of Pillar, cabinets and DPs.

BATCH SIZE = 15.

Certificate Level – II

		Hrs.
1	Hardware Components of a Computer system: Identify and check status of devices, install new devices	6
2	Operating System and Application Software: Installation and configuration	10
3	Introduction to the components of Computer Networking: Cables, Switches, Routers, WAP	8
4	Practical with UTP Cables:	6
5	Practical in LAN: Finding fault and trouble-shooting	10
6	MDF/DDF: Opening and Familiarisation with MDF/DDF component like tag block, fuse, protecting devices, testing devices, patch card for termination of OFC cable etc.	30
7	MDF/DDF Cables : Different Type of cables to be terminated on MDF including primary cable, coaxial cable, PVC cable and jumpering at MDF and OFC cable to be terminated at MDF.	30
8	Termination at MDF/DDF: Termination techniques at MDF tag blocks for different type of cables and jumpers Mounting of fuses and protecting devices in tag blocks at MDF and termination of OFC cable at DDF and jumpering of OFC cable patch card.	30
9	Description of Subscriber line testing: Testing of subs line for low insulation, earth on both link, break fault, loop fault and ring tone testing etc in copper cable and break fault DB loss in OFC cable.	30
10	Hardware Components of a Computer system: Identify and check status of devices, install new devices	6
11	Operating System and Application Software: Installation and configuration	10
12	Introduction to the components of Computer Networking: Cables, Switches, Routers, WAP	8
13	Practical with UTP Cables:	6
14	Practical in LAN: Finding fault and trouble-shooting	10
15	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
	Total Vocational Content	206

Skill Set

After the course , the learner will be able to :	
1	Identify various components of computer systems
2	understand the basic concepts and configurations of Operating System and application software
3	get acquainted with components of networking
4	Understand the basic facility provided at MDF and DDF including testing of subscriber line and provisioning of protecting devices.
5	To understand the technique to terminate different types of cables at MDF and DDF .
6	To understand the jumpering facility to provide connection/ shifting of telephone connection/providing of lease line connections etc at MDF and DDF.

Lab Equipment and Devices required

1	Tag block, fuse, protecting devices, testing devices, patch card for termination of OFC cable etc. And primary cable, coaxial cable, PVC cable and jumpering at MDF and OFC cable
2	Different type of terminating tools like cutter, knife, punching tools
3	Subscriber line tester and OTDR

BATCH SIZE = 15.

Certificate Level - III

		Hrs.
1	Internet: Services available	6
2	Database Management Tool and Applications	10
3	Information to HTML & XML	10
4	Website designing	10
5	Societal impacts of IT	4
6	Planning of Primary, Secondary and Distribution cable	50
7	Laying of Primary, Secondary and Distribution cable	50
8	Underground cable identification and jointing	50
9	Installation of Cabinets, Pillars and DPs including mounting of tab blocks and termination of underground cables on them	70
10	Usage of various tools:- Multi-meter/ tester , Earth meggar, Crimping tools, and testing of UG cables	60
11	Internet: Services available	6
12	Database Management Tool and Applications	10
13	Information to HTML & XML	10
14	Website designing	10
15	Societal impacts of IT	4
16	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 3 hours)	9
	Total Vocational Content	369

Skill Set

1	Understand the services available in Web and internet
2	Explain the Database Management Tools
3	Explain the techniques of designing websites.
4	Plan underground cable in an efficient way show that cost of cable is minimum and there is no pocket which is technically not feasible in the area under planning.
5	Grasp the different types of colour codes of the underground cable for jointing and identification purpose.
6	Explain the installation procedure of different DPs, Pillar and cabinet.
7	To get familiarized with testing procedure of under ground cable and fault localization.

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Lab Equipment and Devices required

1	Tag block, fuse, protecting devices, testing devices, patch card for termination of OFC cable etc. And primary cable, coaxial cable, PVC cable and jumpering at MDF and OFC cable
2	Different type of terminating tools like cutter, knife, punching tools
3	Suscriber line tester and OTDR

BATCH SIZE = 15.

Certificate Level - IV

		Hrs.
1	Overview of TELECOMMUNICATION (EVOLUTION FROM ANALOG TO DIGITAL): History of telephony from invention of phone, small manual telephone networks in cities, to national networks. Automation of call switching, mechanical exchange, electromechanical exchange. Electronic switching. Analogue , Digital transmission, multiplexing, cable-microwave-satellite- fibre. Packet network and Internet.	10
2	VISIT TO DIFF TELECOM INSTALLATIONS & IDENTIFICATION: Exchanges, Microwave, Satellite, OFC, Mobile, Data Centre, Broadband lab.	20
3	DIGITAL TRANSMISSION MODULE: THEORY AND PRACTICAL: Analogue transmission, FDM. PCM principles, multiplexing (PDH). . Demonstration in all Labs.	40
4	DIGITAL SWITCHING TECHNOLOGY: BASIC (Theory and Practical): Fundamentals of electronic switching. Digital switching. Components of an Electronic switch. Functional blocks. Signal Flow and Signalling. Reports and Maintenance.	40
5	RADIO COMMUNICATION: THEORY AND PRACTICALS: Basic block diagram and functions. Analogue radio systems- 6 Channel, 8 channel, 10 channel UHF. Digital Microwave. Digital modulation techniques. Practical on measurements, loop back error rate tests.	40
6	PROJECT ON OPTICAL FIBRE AND SWITCHING: splicing of fibre and joining preparation. Location of fault with OTDR. Identification of different racks with functions. Creation of new number.	30
7	Advanced Computer Networking: Configuration of router, Unix commands, Protocols used in each layer of OSI,IP addressing , IPV-4 and IPV-6 basics	50
8	Mini-Project1 : Project concerned with Optical Fibre communications	20
9	Field Visits: This is to be organized on live optical transmission systems: GPON, EPON, STM-16,DWDM, Network Management System	12
10	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	274

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Skill Set

1	Understand the basic nature of telecom and need for its evolution to present day.
2	Identify different telecom equipment in general to have a feel of the actual systems as compared to figures in books
3	Understand the need for transmission, and why digital transmission. Functional blocks of a digital transmission system. Explain PCM principles and methods of digital (PDH) Multiplexing. Different levels of multiplexing and channel capacities
4	Understand the fundamentals of electronic switching. Steps involved in setup of a call and termination , billing. Identify the different racks in electronic exchange and understand how to create a new number.
5	Understand the purpose and main blocks of a radio communication system, frequencies used in radio communication. Effect of noise on performance and S/N ratio. Modulation techniques used for radio comm and also digital communications. Measurements, error rate tests.
6	Carry out OF cable joints and placing the joint in joint closure and locate fault with OTDR.
9	Identify the parts of an electronic exchange and create a customer.

Lab Equipment and Devices required

1	Either Lab or Actual Site for: Digital Exchange, Transmission center, Satelite , Broadband.
2	PDH Multiplexer, DTA, Microwave system for visit
3	Any Digital switch is required for visit.
4	OFC, Patch cords and pigtails, PC with internet, Splicing Machine, Cleaver, Isopropyl Alcohol, Tissue Paper, Jacket remover, cutter, Joint closures, OTDR, Fiber Stripper, Power meter, Optical Source

BATCH SIZE = 15.

Certificate Level - V

		Hrs.
1	Advanced Switching Systems & NGN - IPTAX: Need for convergence in telecom between circuit and packet switching and multimedia. Basic concept of Next Generation Networks. Blocks of NGN. Need for IP TAX. Block schematic of IPTAX. Interface of IPTAX with rest of telecom network.	20
2	Project on Advance Switching : Identification of parts of NGN and study of its functions. Interconnectivity of IPTAX.	20
3	ADVANCED TRANSMISSION SYSTEMS: DIGITAL SATELITE, SDH, DWDM, NGSDH, MSPP: Need for new technology in transmission for digital services and data services. Integration of new Packet protocols in SDH standard and frame structure. Basic format of NGSDH & MSPP. Evolution of wavelength division multiplexing and DWDM. Blocks, functions and capacities.	25
4	Project on Transmission System: Study of NGSDH System, and DWDM system.	15
5	Mobile Communication Basics: cellular communication, evolution of digital standards - GSM & CDMA.	15
6	MPLS Basics, Router/LAN Switch	15
7	System Administration: Time and Password management, LOG files, Annual Maintenance Contact and Handling of emergency in Exch etc.	15
8	Mini-Project1 : Project concerned with Digital Transmission Equipment,	40
9	Mini-Project2 : Project concerned with Optical Fibre Cable system	40
10	Mega-Project1: Project concerned with Latest Optical transmission technology	50
11	Field Visits: This is to be organized on live optical transmission systems: GPON, EPON, STM-16,DWDM, Network Management System	50
12	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers	24
13	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	491

Skill Set

1	Understand the concept of convergence and explain the blocks of NGN. Understand the role and need of IPTAX in modern telecom networks for one single infra to support voice, data and video.
2	Identify the different racks and component of an NGN System and their role in the network. Explain the necessity of IPTAX and its advantages in modern network technology.
3	Explain the necessity of integration of data standards into SDH frame format. Understand the standards in MSPP & NGSDH. Explain and plan a DWDM network for a given area. Explain the new bands used in digital satellite and different services on that for enterprise customers.
4	Understand the block schematic of digital mobile (GSM). Call flow, control channels, mobility management, roaming, and handovers.

Lab Equipment and Devices required

1	Soft switch, Medial Gateway, Announcement Server, LAN Switch, Router
2	Transmission Systems like SDH, DWDM, NGSDH, OFC, Patch cords and pigtailed, PC with internet, Different OS, OSA, Network Tester, Power meter, Optical Source
3	Testing Sims with Mobile hand set ii. Lab with live GSM nodes. iii. Connectivity with two GSM lab, iv. Connectivity with nodal centre

BATCH SIZE = 15.

Certificate Level - VI

		Hrs.
1	VPN: Concept of creating a personalised CUG on a public network to give customised service at a lower cost. Different protocols involved.	40
2	MPLS: Faster switching of packets in routers by use of labels in place of IP addresses. Make network faster and robust. Easier to expand and flexible services to customers.	60
3	3G: Hi speed data services using mobile with WCDMA in the core to give higher bandwidth. Components of a 3G network. Services, hispeed data, video calling, HSDPA.	60
4	BROADBAND: Always on internet facility on your phone with the phone working independently and billed separately. Components of broadband network, services, speeds.	60
5	Lease Line & MLLN: Leased line service. Users and advantages, costs. Managed leased line services. The customer network is monitored remotely by service provider. All provisioning and up gradation are done remotely (centrally) from NMS. Components of an MLLN network and its deployment. Advantages over normal leased line service.	120
6	Mini-Project1 : Project concerned with Digital Transmission Equipment,	40
7	Mini-Project2 : Project concerned with Optical Fibre Cable system	40
8	Mega-Project1: Project concerned with Latest Optical transmission technology	50
9	Field Visits: This is to be organized on live optical transmission systems: GPON, EPON, STM-16,DWDM, Network Management System	50
10	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers in the field of transmission	24
11	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 4 hours)	12
	Total Vocational Content	556

Skill Set

1	Understand the concept of convergence and explain the blocks of NGN. Understand the role and need of IPTAX in modern telecom networks for one single infra to support voice, data and video.
2	Identify the different racks and component of an NGN System and their role in the network. Explain the necessity of IPTAX and its advantages in modern network technology.
3	Explain the necessity of integration of data standards into SDH frame format. Understand the standards in MSPP & NGSDH. Explain and plan a DWDM network for a given area. Explain the new bands used in digital satellite and different services on that for enterprise customers.
4	Understand the block schematic of digital mobile (GSM). Call flow, control channels, mobility management, roaming, handovers.
5	Explaining the need of leased line service for any customer, facilities and costs involved. Also the basic hardware and configuration involved. Understand need of a Managed service where network can be configured as well as maintained/monitored centrally through NMS.

Lab Equipment and Devices required

1	CPEs, (Router/switch), Edge Router, Core Router, PC with internet, Different OS,
2	3G lab with live nodes, HSDPA supported cards, 3G supported handsets, SIM cards
3	Tier-I & Tier-I, BRAS, BNG, CPE
4	One unit of Central office terminal, One unit of ROT with PC loaded with MLLN software

BATCH SIZE = 15.

Certificate Level – VII

		Hrs.
1	Softskills: communication skills, presentation techniques, design and preparation of documents relating to business case, training, report etc. Written communication. Handling different types of clients.	40
2	Managed Network Service: Concept, need, Single window solution for customers' needs. Proactive and round the clock monitoring. Services portfolio and tariff structures.	40
3	Market Survey for the product: Meeting customers, feedback forms, questionnaire. Analysis and conclusion. AND _	40
4	Project on Market Survey	50
5	Marketing skill: 7 P's of Marketing, Segmentation, product placement, PR Campaigns, Marketing strategy	70
6	Sales Skill: Customer communication, presentation before corporates, Negotiation skills, risk management. Handling people, stress and crisis.	70
7	Enterprise Solutions: Managed Email, Software as a Service, Cloud Computing, Audio Conferencing, Video Conferencing, Web conferencing, Global MPLS.	120
8	Computer Fundamentals: Configuration and Customisation of Desktop environment	6
9	Office tools: MS Word	8
10	Office tools: MS Excel	12
11	Office tools: MS Powerpoint	8
12	Internet Concepts: Websites, e-mail,	6
13	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 2 hours)	6
14	Mini-Project1 : Project concerned with Digital Transmission Equipment,	40
15	Mini-Project2 : Project concerned with Optical Fiber Cable system	40
16	Mega-Project1: Project concerned with Latest Optical transmission technology	50

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		Hrs
17	Field Visits: This is to be organized on live optical transmission systems: GPON, EPON, STM-16,DWDM, Network Management System	50
18	Work Shops: 4 workshops with 6 hours duration to facilitate interaction with the field engineers in the field of transmission	24
17	Examination (practical and theory) at the end of 3rd month , 6th month and at the end of the session (Each exam will be of 6 hours)	18
Total Vocational Content		698

Skill Set

1	Present himself before any audience and communicate effectively. Prepare business case (complete documentation) for clients. Also design any document, eg, course for training. Handle meetings with corporate effectively.
2	Understand the need for Managed Network Service and the customer psychology behind it. Concept of single window, proactive monitoring by operator, customized service and customer care. Explaining the tariff structure and also the benefit to customer.
3	Design questionnaires for obtaining feedback from market. Perform survey for any service / product in the open market with public and give conclusion from the data collected.
4	Understand the fundamental Principles of Sales and Marketing. Perform duties in this role effectively as a team member.
5	Explaining all the features the Enterprise services: Managed Email, Software as a Service, Cloud Computing, Audio Conferencing, Video Conferencing, Web conferencing, Global MPLS. Also deliberate on the benefits of these to the corporate.

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Lab Equipment and Devices required

1	Visit to IDC
2	Access to Enterprise Customers of BSNL

BATCH SIZE = 15.