

Memorandum of Understanding
Under the Employability Enhancement Training Program [EETP]

Between

All India Council for Technical Education, New Delhi

And

Bharat Sanchar Nigam Limited, New Delhi

Date: 27th February 2013

AGREEMENT

This Agreement is entered into and executed on this 27th day of February, 2013 at New Delhi.

BY AND BETWEEN

All India Council of Technical Education (hereinafter called "AICTE"), a Statutory Body of Ministry of Human Resource Development, Govt. of India, established under the All India Council for Technical Education Act 1987, represented by its Chairman, having its office at 7th Floor, Chanderlok Building, Janpath, New Delhi-110001 which expression shall, where the context so admits, be deemed to include its successors, executors and administrators of the **ONE PART**

AND

Bharat Sanchar Nigam Ltd., (hereinafter referred to as the "**BSNL**") a company registered under the Companies Act, 1956, through its Chairman & Managing Director having its registered/approved office at Bharat Sanchar Bhavan, H.C.Mathur Lane, Janpath, New Delhi-110001 (which expression, unless it be repugnant to the context or meaning thereof, shall be deemed to mean and include their executors, administrators and assigns), party of the **SECOND PART.**

WHEREAS, the All India Council for Technical Education has initiated a scheme to Employability Enhancement Training Program (EETP) to provide competency based employability enhancement skills under the EETP;

WHEREAS under the scheme BSNL Training Centres/set-ups are required to perform the role and function of providing hands on skill training in Communication and all its related areas with such training centres/set-ups located preferably all over the country.

WHEREAS the First Party is to participate as a Regulator under the Employability Enhancement Training Program (EETP)

WHEREAS the Second Party has expressed its keen interest and desire to be a key partner in the execution of the Employability Enhancement Training Program (EETP) in terms of the objectives of the scheme and policy as highlighted and specified in the said program and particularly in view of the desire and interest of BSNL to join and partner with AICTE in providing competency based skills through its training centres/set-ups for the purposes of the scheme;

WHEREAS both parties have held discussions and agreed for collaboration for conducting Employability Enhancement Training Program (EETP) whereby BSNL will impart the requisite training and award credits for the training conducted on its own, to the registered students.

THEREFORE, both the parties hereby agree that the Training Centres/set-ups of BSNL, as approved and recognized by BSNL and registered with AICTE from time to time shall be known as and act/perform the role of “Training Providers” under the scheme to conduct Employability

Enhancement Training Program (EETP) initiated by AICTE on the following terms and conditions :-

1. That BSNL agrees that centres/set-ups approved and recognized by BSNL and registered with AICTE [herein after to be referred as “BSNL-TP”, as mentioned in schedule 1 to this agreement shall act and perform the role of Training Provider to provide hands on skill training in specific sector such as Telecommunications and all its related areas.
2. That BSNL agrees and undertakes that its “BSNL-TP” as specified in Schedule 1 to the agreement shall register with AICTE for conduct of skill training modules under the EETP and shall perform following functions :
 - a. Announce the schedule of skill training modules for calendar year.
 - b. Register students for the modules and upload the same on AICTE website.
 - c. Conduct the skill modular training.
 - d. Conduct examination/evaluate the student, award the grade indicating completion of Training and uploading the same on the AICTE website.
 - e. The BSNL-TP recognized and approved by BSNL as provided in Schedule 1 may register students as provided by the AICTE funded Institution for the purpose
3. The BSNL-TP shall also sign a local MOU with the AICTE funded Institution for the purpose and finalize the terms and conditions for

such an engagement under the EETP which shall include the award of credits.

4. The BSNL-TP as specified in Schedule 1 to the agreement, may take flexible training timing and schedule in consultation with the AICTE approved and funded Institute.
5. The BSNL - TP shall announce and inform through its website, the schedule of the Skill Modules it plans to offer in the academic year concerned for the information of the prospective students and it shall accept the students as provided by the AICTE approved and funded Institute.
6. The BSNL – TP shall be entitled to the fees as mentioned in the Table 1 below.
7. The BSNL – TP will conduct appropriate training sessions as per the following **pedagogy**.
 - a) These various programs on different topics under this project will focus on practical hands-on training in field/lab supplemented with structured academic content that shall be provided online and may be supplemented with appropriate theory sessions in AICTE approved/funded institutions and colleges.
 - b) Practical sessions shall be held in **flexi-mode** that shall expose the students to various telecom equipments in terms of their operations.
 - c) Academic content shall focus on the various operational procedures/facets of the telecom equipment/technologies present

in the BSNL network related to the practical sessions in an attempt to provide the student with **high end equipment handling practical skills as opposed to rote learning.**

- d) Program **Academic Structure:** The complete spectrum of telecom practical skill learning shall be divided into 7 modules. The duration of the skill-part of the program in BSNL set-ups/training centres shall be incorporated into three academic semesters of conventional engineering education (B-Tech), starting with 5th semester.
- 70 practical sessions of 2 hours each (140 hrs)
 - 7 field visit sessions of 2 hours each (14 hrs)
- e) In brief, the training sessions shall introduce the trainee to various planning and operational aspects, e.g. subscriber creation, route creations, network optimization, network performance monitoring, fault rectification, traffic reporting, network planning and dimensioning, etc.
- f) The online content/theory sessions provided shall be support material for the practical sessions in terms of descriptions and explanations obtained from our equipment manuals. Normally, it shall not address theoretical concepts that students learn as part of communication engineering.

Table 1

1	Eligibility of the AICTE approved and funded Institute	AICTE approved Govt and Govt aided Institutes and NITs
2	Eligibility of the Coordinator	Full time regular Faculty
3	Duration of the Programme	8 weeks after graduation and 12 weeks for students who are currently enrolled: The training may be spaced between 5 th , 6 th , and 7 th semesters, covering all seven certificate programs, for the currently enrolled students. (70 practical sessions of 2 hours each + 7 field visits of 2 hours each making a total of 154 hours; the distribution of which may be decided in consultation with the technical campus.
4	Limit of Funding	BSNL skill program fees shall be limited to and not lesser than Rs.10,000 + ST per semester per student totaling to Rs. 30,000 + ST per student across the three semesters.
5	Disbursement of grant	Quarterly reimbursement by AICTE on submission of documents mentioned in 6. One of BSNL TPs shall be designated as nodal for liaising with AICTE Headquarters at Janpath for processing of the reimbursement.
6	Relevant Documents	Project completion report with Payment & Receipt A/c, Utilization Certificate.
7	Expected Outcome	To enhance quality of students so that they become better employable.
8	Processing Methodology	Evaluation by three member expert committee.

A summary of the seven skill modules that shall be delivered under this agreement are as per schedule II.

8. The BSNL - TP will evaluate the students for the Training Skills and award grades and such grade sheet be submitted to the AICTE approved and funded Institute.

9. The BSNL - TP shall maintain a record of the registered students and certificates issued and upload the same on the AICTE web portal.
10. **No Confidentiality:** There shall not be any confidentiality of any information disclosed to by both parties to each other, either in operationalizing this agreement or for the purposes of implementing this agreement. The information sought under Right to Information Act or otherwise by any student, shall be promptly made available.
11. The BSNL agrees and undertakes that the BSNL - TP as recognized and approved by it, which are shown in Schedule 1 to the agreement, shall act as Training Provider in terms of the agreement signed by them with the AICTE approved and funded Institute in their vicinity and the agreement to be signed between the AICTE approved institute and the Training Provider shall provide the details regarding the schedule of operation, in order to protect the interest of students and all concerned stakeholders.
12. The BSNL agrees and undertakes that its BSNL - TP reflected in Schedule 1 to the agreement shall participate, operate and execute the scheme strictly in accordance with the scheme and AICTE for conduct of EETP and shall not indulge in any violation of the scheme.
13. The Scheme of the AICTE to provide competency based skill under EETP shall be treated as part and within the scope of the present agreement for all purposes.
14. Both the parties shall indemnify and keep the other party indemnified and harmless against any and all claims, actions,

proceedings by third party (including all costs, expenses, damages / losses) arising out of or in connection with this MOU due to breach of any provisions of this MOU by such party or as a result of any act of negligence / omission or commission on part of such party and / or its employees, agents etc.

15. The BSNL – TP’s registered as Training Providers shall continue as such for a period of at least 3 years from the date of execution of this agreement, which may be renewed in accordance with the provisions of the scheme from time to time subject to the sole decision and discretion of the AICTE and on such terms and conditions, which may be decided or determined by AICTE additionally. However, in case the registration of either party with the AICTE is suspended or terminated, the instant agreement shall stand determined and terminated with immediate effect.
16. During the operation of MoU circumstances may arise which may call for alternations or modifications or amendments to this agreement. These alterations or modifications or amendments will be mutually discussed and agreed upon in writing. No amendment or change hereof or additions hereto shall be effective or binding on either of the parties hereto unless set forth in writing and executed by the respective duly authorized representatives of each of the parties hereto.
17. The AICTE shall have the right to deregister any BSNL - TP as Training Provider under the Scheme during the subsistence of the present agreement without assigning any reason for whatsoever.

Additionally, it is open to AICTE to de-register a Training Provider on account of receipt of complaint or malfunctioning in execution of the provision of the scheme or its objectives.

18. If any dispute arises between AICTE & BSNL on operation and execution of the agreement, efforts shall be made to resolve the same amicably and if the dispute is not settled then it shall be referred for arbitration to the Chairman, AICTE, who shall be the sole arbitrator in the matter and whose decision shall be final and binding to the parties.
19. The present agreement can be terminated by the AICTE by giving a notice of one month to BSNL without assigning any reason in this regard and the BSNL shall have no claim against AICTE and its officials on account of termination of such agreement. However, the responsibilities and duties of both parties in respect of the common students already registered for any of the EETP Programs shall not end with the termination of the agreement, and these will remain valid in totality until completion of evaluation of the already registered students and reporting of their results by both parties.

20. Effective Date:

This agreement is effective from the date signed by both the parties will be valid for a period of three years until determined, suspended or terminated earlier.

IN WITNESS WHEREOF, the parties hereto, each acting under due and proper authority, have executed this mutually binding Memorandum of Understanding as of the date first written above.

For AICTE:

For BSNL

Signed: _____SD_____

Signed: _____SD_____

Name: Dr K.P.ISAAC

Name: H.C.PANT

Title: Member Secretary

Title: CS & Sr.GM(Legal)

Date: 27th February 2013

Date: 27th February 2013

Witnessed by:

1) Signature: _____SD_____

Name: NEERAJ VERMA

Date: 27th February 2013

2) Signature: _____SD_____

Name: M.K.DADA

Date: 27th February 2013

3) Signature: _____

Name:

Date:

Schedule I

List of Training centres/set-ups of BSNL

1	AL TTC GHAZIABAD	Raj Nagar, Ghaziabad, Uttar Pradesh PIN. 201002
2	BRBRAITT JABALPUR	Ridge Road, Jabalpur PIN. 482001
3	ARTTC RANCHI	Near Jumar River, Hazari Bagh Road, Ranchi PIN 835 217
4	RGM TTC CHENNAI	Near Palavanthangal Rly Stn, GST Road, Meenambakkam PIN 600027
5	NSCBTTC KALYANI	Kalyani Simanta, Distt Nadia (WB) PIN 741235
6	RTTC AHMEDABAD	Sarkhej-Gandhinagar National Highway, Near Gota Cross Road, Jagatpur, Ahmedabad PIN 382481
7	RTTC BHUBANESHWAR	Vani Vihar, Bhubaneshwar PIN 571007
8	RTTC CHENNAI	Periar Salai, SIDCO Industrial Estate, Maraimalai nagar, Chennai PIN 603209
9	RTTC GUWAHATI	S. R. Bora Road, ULUBARI, GUWAHATI PIN 781007
10	RTTC HYDERABAD	Gacchibowli, Hyderabad-500032 PIN 500032
11	RTTC JAIPUR	PLOT NO.SPB, ROAD No.14, VKIA, JAIPUR PIN 302013
12	RTTC LUCKNOW	LDA COLONY, SECTOR-G, KANPUR ROAD, LUCKNOW PIN 226012
13	RTTC MYSORE	T.K.LAYOUT, NEAR KAMAKSHI HOSPITAL, MYSORE-570009 PIN 570009
14	RTTC NAGPUR	OPP. TV TOWER, SEMINARY HILLS, NAGPUR PIN 440006
15	RTTC PUNE	G. BLOCK, PLOT NO 121/122 MIDC, CHINCHWAD PUNE PIN 411019
16	RTTC RAJPURA	PATIALA BYEPASS ROAD, VILLAGE- NEELPUR, RAJPURA PIN 140401
17	RTTC TRIVANDRUM	KAIMANAM P.O. TRIVANDRUM PIN 695040

SCHEDULE II
Module 1- Digital Switching System

Learning Objective:	To give the trainee a detailed overview of the electronic switching systems that are the nodal points of all telecom networks.
Credits:	As per university norms
Prerequisites:	First year Engineering or Graduate course in science.
Skills acquired:	The trainee shall be able to understand and obtain hands on practice on various components of a digital exchange, create and modify customer and exchange data, carry out testing and trouble-shooting and understand the routing, traffic, trunk and billing administration and management.

S. No	Curriculum	SKILL HOURS	EQUIPMENT
1.	Identification of various components of telephone exchange like MDF , FDF ,DDF, Power Plant and identification of functional blocks of Digital exchanges	2	<ul style="list-style-type: none"> • C-DOT MAX or any New Technology Switch • EPABX • Line tester • VoIP Facility • MDF, DDF, FDF • Power plant • ISDN Feature phone Telephone connection with handset • Types of cables (power, switch board, PCM. LAN) • Different types of connectors (Euro, D, RJ) • FAX • Pillar, cabinet, DP • Lab/exchange with two lines created • VCC card • Telephone line to make VCC/FPH call • Loop back trunks to test the calls
2.	CPE and MDF (Analog telephone ,Digital telephone, FAX, Answering machine, Cordless phone, Identification of different types of cables Main Distribution Frame, cabinet pillar, DP) Different services and their access codes, services provided by switch like auto alarm, diversion, call waiting , CLIP,CLIR, and services provided by common platform like VCC,FPH, Making line to line calls and checking the metering	2	
3.	Creation of Subscriber Physical Connectivity from customer premises up to equipment . Interrogation of subscriber characteristics by means of MMC In case of ISDN line NT, TA etc	2	
4.	Deletion and modification of customer data in data base and checking their effect like BNP Annce and BNP disconnection , reconnection safe custody etc	2	
5.	To register and verify various facilities by means of MMC (Call diversion, call waiting, Conferencing,	2	
6.	Hunt group and centrex (creation of hunt groups and centrex groups	2	
7.	Testing the subscriber line (wedging the line at MDF, Testing the line by means of MMC, fault localistion from the test reports	2	
8.	Different types of observations like outgoing , incoming , malicious etc. Different types of traffic reports and CDR details.	2	
9.	Digital Trunk and Routing Management (The parameters related to trunk and routes by taking display of TGP's and routes, Testing of trunks)	2	
10.	Hierarchy of nodes in PSTN, ISD, and long distance calls, Special service calls. etc	2	
Total 10 sessions each of 2 Hrs		20 Hrs	

MODULE 2- Digital Transmission Technology

Learning Objective:	To give the trainee a detailed overview of the Digital Transmission technology that is the backbone of all telecom networks.
Credits:	As per university norms
Prerequisites:	First year Engineering or Graduate course in science.
Skills acquired:	The trainee shall be able to understand and obtain hands-on practice on the various transmission media, system components, transmission systems, SDH equipment. microwave systems. DWDM and FTTH systems.

Session No.	Curriculum	SKILL HOURS	EQUIPMENT
1.	Visit and demo on different transmission media like-MDF, DDF, Copper cable, CAT-5/6, OFC, RF Cable, Antenna etc.	2	<ul style="list-style-type: none"> • STM-1 /STM-4 equipped with important cards • LCT /NMS for SDH • Different M/W Systems • Satellite System • Mini-Links • DWDM (OTM, OLA) with LCT • DXC • Different types of Splitters • Different types of ONT's • GPON/GEAPON OLTE • MDF,DDF • FDF/FDMS • CAT-5/ CAT-6 • Cables/ Copper Cables • OF Cable/ RF Cables • Different types of Antenna • Different types of Optical Connectors • PDH System • Multimedia of SDH (to be provided by BRBRAITT)
2.	Visit to Mux room and different transmission system – like PCM, PDH, ADM, TM etc.	2	
3.	Identification of connectors and components of Optical Transmission Systems like – SFPs, Optical Connectors like FC-PC, SC-PC, LC-FC, Pigtail and patch cord, LASER, FDF, TJC etc	2	
4.	Multimedia of SDH & visit	2	
5.	Network & Hardware Architecture of SDH Equipment- Identification of different Network Element, Ring Architecture, Identification of different cards and their purpose etc.	2	
6.	Software configuration in SDH- Cross connection using LCT/ NMS/ EMS	2	
7.	Software configuration in SDH- Alarm Management, Performance management, Synchronization	2	
8.	Visit and demo to Microwave Mini link /Microwave System/ Ku Band VSAT System*	2	
9.	Visit and demo to DWDM System*	2	
10.	Visit and demo to FTTH System	2	
	TOTAL SESSIONS	20 Hrs.	

* Where ever available

Module 3- Optical Fiber Technology

Learning Objective:	To give the trainee a detailed overview of Optical Fibre Technology.
Credits:	As per university norms
Prerequisites:	First year Engineering or Graduate course in science.
Skills acquired:	The trainee shall be able to understand and obtain hands-on practice on optical fibre systems that shall include cables, connectors, splicing, tools, optical devices, OTDR and other measuring instruments.

Session	Curriculum	Skill Hrs.	Equipment
1.	Visit and demo of different transmission media MDF, DDF, Copper cable, CAT-5/6, OFC, RF cable, Antenna etc.	2.0	<ul style="list-style-type: none"> • MDF, DDF, FDF • CAT-5/CAT-6 Cables/Copper Cables • RF Cables • Different types of OF cable • Different types of Optical connectors • Splice closures • Pig tail & Patch cord, • Different types of OF Tools • OF Cables • Fusion Splicing Machine • OTDR • Fiber Spool • Power Meter • Fixed/ variable Attenuator • Light Source • Different types of Antennas • SDH Systems • DWDM Systems (OTM/ OLA) • Route Index Diagram • Route/Joint Indicators • HDPE/PLLB Duct • Different types of Splitters • Different types of ONT's • GPON/GEAPON OLT • OF Systems PDH, • OF Systems SDH
2.	Different types of Optical Fiber Cable Identification of different types of OF Cable, Component of Loose Buffer Tube & Tight Buffer Tube Cable and their functions, Identification of different types of Connectors.	2.0	
3.	Identification of different OFC Tools & Splice closures Different tools and their utility- Cable sheath remover, Buffer Stripper, Fiber Stripper, Fiber Cleaver etc. Different types of Joint Closure- TJC, BJC, SJC etc. Route indicators, RID, ducts and pipes (HDPE & PLLB)	2.0	
4.	Application of OF Cable & Optical Devices FDF Indoor connectivity of OF Systems, Transmitter & Receivers, LASER, APD	2.0	
5.	End Preparation of Cable Steps for end preparation of Optical Fiber Cable for Splicing and demo in lab	2.0	
6.	Splicing of OF cable Component of Fusion Splicing Machine, Procedure for splicing of OF cable and demo, Splice loss measurement	2.0	
7.	Demo on OTDR Study the different components of OTDR, Setup for operation of OTDR, Fault localization and measurement like fiber break, total loss, splices loss, dead zone etc.	2.0	
8.	Power Meter & Other Measuring Instruments Operation of Power Meter, Power measurement of LASER Study of other meters like attenuator, talk-set, source etc.	2.0	
9.	Visit and demo to FTTH Study the network architecture of FTTH, Identify the different network elements of GPON/GEAPON Systems	2.0	
10.	Visit and demo to SDH / DWDM* Study the network architecture of SDH / DWDM* system, Identify the different network elements and cards of SDH / DWDM* Systems and study their function.	2.0	

Module 4- Mobile Communication

Learning Objective:	To give the trainee a detailed overview of the Mobile Communication Systems.
Credits:	As per university norms
Prerequisites:	First year Engineering or Graduate course in science.
Skills acquired:	The trainee shall be able to understand and obtain hands-on practice on 2G mobile systems, create and modify customer and exchange data, mobile services, carry out testing and trouble-shooting, mobile antenna systems, GSM radio parameters and optimization of network.

S. N.	Curriculum	Skill Hours	Equipment
1	2G GSM Equipment Demonstration: GSM Architecture diagram-BTS, BSS, MSC, HLR, VLR and their interfaces	2	<ul style="list-style-type: none"> • GSM/ 3G Test Handset • Demo SIM with VAS services • CCN Node Terminal • HLR Terminal • PC • BTS BSC • visit to MSC • Antenna system with feeder cable • VSWR meter if available • OSS/OMCR terminal <p>Field visit and other infrastructure</p>
2	Saving and dialing procedures for Call/SMS in different scenarios; - while on roaming, while in local service area GSM Network Identities – IMSI, IMEI, MSISDN etc	2	
3	GSM Subscriber Creation.(CCN Node/ In Lab) Creation of subscriber using Kennan FX (or in Lab, if available), Billing CDRs, IN Query	2	
4	Creation of various facilities: Assignment and withdrawal of services to mobile subscriber- STD barring, Call Divert, Call Forwarding, Missed Call Alert etc.	2	
5	Mobile Services – VAS- PRBT, IVR and SMS Based, USSD, STK, Activation, De-activation.	2	
6	Internet Access – GPRS & EDGE. Configuration for access through Mobile and PC, APN Configuration, Downloading settings in Mobile	2	
7	2G BSS: BSC/BTS Configuration, Connectivity, Faults / Alarms etc.	2	
8	Mobile Antenna Systems, Feeder Cables Type of Antenna, Gain, Coverage Identification BTS Testing - Feeder Cable & VSWR.	2	
9	Study and Analysis of GSM Radio Parameters through Engineering Handset- Cell, LAC, Channel, HSN, MAIO	2	
10	Optimization of Network Performance – QOS Parameters, KPIs, Benchmarking	2	
	TOTAL SESSIONS	20 hrs.	

Module 5- IP Networking & Cyber Security

Learning Objective:	To give the trainee a detailed overview of IP Networking and Cyber Security.
Credits:	As per university norms
Prerequisites:	First year Engineering or Graduate course in science.
Skills acquired:	The trainee shall be able to understand and obtain hands-on practice on IP Networking and Cyber Security practices, LAN cabling and configuration, Router configuration, FTP protocol services, various security tools and securing PCs and Servers.

S. No.	Contents		Equipment
1.	Identification of Network Components, Preparing straight & cross RJ-45 LAN cables	2	<ul style="list-style-type: none"> • Internet Connectivity • NICs • Cables & connectors • PC, Server and related SW Proxy • FTP • IIS • Firewall • Look at LAN • Packet tracer • Advanced IP Calculator (Freeware) v1.1 • Network Simulator SW • Copy of the video demo files for Cyber Security • UTP, cat5, Cat6, Coax • OFC • Hubs • Repeaters • Switches • Bridges, Routers • Gateways • CSU/DSU • Wireless access points (WAPs) ADSL Modems, Crimping Tool
2.	Preparing & Testing Wired Local Area Network, Configuring IP Addresses in a LAN, Practice on Wireless Local Area Network, VLAN on simulator / Systems	2	
3.	Identify Router Components & Configure Router on simulator / Systems	2	
4.	Excercises on TCP/ IP	2	
5.	Configuration of Proxy, File Transfer Protocol services	2	
6.	Configuration of Dynamic Host Control Protocol services	2	
7.	Multimedia Demo of Viruses, Trojan Horse, Worms	2	
8.	Multimedia Demo of SPAM, Spoofing, Phising, Identity frauds, Social Networking etc	2	
9.	Demonstration on Security tools like IP scanner, Port scanner etc.	2	
10.	Securing Home PC & Web Server – Installing & Updating Antivirus, Antispyware, Hardening of Operating System by turning of unnecessary services, clients & features	2	
Total 10 sessions each of 2 Hrs		20 Hrs	

Module 6 – TELECOM SUPPORT INFRASTRUCTURES

Learning Objective:	To give the trainee a detailed overview of Telecom Support Infrastructure.
Credits:	As per university norms
Prerequisites:	First year Engineering or Graduate course in science.
Skills acquired:	The trainee shall be able to understand and obtain hands-on practice on the maintenance of various power plant equipment and earthing systems, AC units, telecom shelters and towers and engine alternators.

Telecom Support Infrastructure- Job Aids			
SN	Name of the Topic	Hrs	Equipment
1	Identification of different components in Telecom support infra FR, SMPS,, Bty charger, battery set , earth plates , high tension and LT supply)	2	<ul style="list-style-type: none"> • SMPS Power plant • VRLA Battery • Inverter • AC • Voltmeter • Thermometer • Earth tester • Fire Extinguishers • Lightning arrestor • Circuit Breakers • HRC fuses, • Engine Alternator • Package AC • Fire Detector • Fire fighting equipments • Fire detection apparatus
2	SMPS (functional unit identification, various alarms, trouble shooting)	2	
3	VRLA (Measurements, pilot cell, terminal voltage, individual cell voltage)	2	
4	UPS System, Earthing (Measurement of earth resistance., Appearance of earth plates at different points like MDF, switch room)	2	
5	Air conditioning (AC package unit, Split A/C, Window type A/C)	2	
6	Protective systems (Fire extinguishers and their operation Lightning arrestors, Circuit breakers, HRC fuses)	2	
7	Engine Alternator (Demonstration & maintenance tips.)	2	
8	Site visit to Ground Based & Roof Top Tower	2	
9	Site visit to telecom shelter	2	
10	Sub-Station Works in Telephone Exchange and energy conservation features	2	
	TOTAL SESSIONS	20 hrs	

Module 7– BROADBAND TECHNOLOGY

Learning Objective:	To give the trainee a detailed overview of Broadband Technology Systems.
Credits:	As per university norms
Prerequisites:	First year Engineering or Graduate course in science.
Skills acquired:	The trainee shall be able to understand and obtain hands-on practice on broadband system configuration, modems, CPE devices configuration for internet access and IPTV, LAN, Routers and Broadband Network components such as DSLAM, T1/T2 Switches, BRAS/BNG.

S N	Name of the Topic	Hrs	Equipment
1.	Connecting PC, Phone using splitter at Customer Premises, Parallel Phone & Testing Line Parameters using ADSL Tester	2	<ul style="list-style-type: none"> • Broadband connection • Splitters • Telephone Instruments • CPE/ Modem • ADSL line • RJ-11 Cables • PC • ADSL Tester • Wi-Fi Broadband Modem • ADSL CPE , (UTstarcom UT-300R2) • Crimping Tool • DSLAM • IPTV • One Switch • Console cable for accessing the router • Cisco 7613 or any Cisco model • T-I ,T-II Switch • BRAS / BNG • OCLAN for field demo
2.	Configuration of broadband connection a) Always-On/PPPoE/Multi-user mode b) Dial-up/Bridge/Single-user mode	2	
3.	Configuration of broadband Modem	2	
4.	Securing wireless broadband connection & Checking of Speed	2	
5.	Common Broadband Problems, Errors & their troubleshooting	2	
6.	Configuration of CPE for multiple services such as internet access, IPTV	2	
7.	Setup of LAN in home environment	2	
8.	Router Components, Show commands to see running-conf, status of ports, ping	2	
9.	Jumper arrangement at MDF for a) New Customer b) Existing Landline Customer	2	
10.	Broadband Network Components DSLAM, T1/T2 Switches, BRAS/BNG	2	
	TOTAL SESSIONS	20 hrs	