

Syllabus For the trade

of

NETWORK TECHNICIAN
(SEMESTER PATTERN)

Under
CRAFTSMAN TRAINING SCHEME

Designed in :2013

By
Government of India
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
Directorate General of Employment & Training
Ministry of Labour & Employment
EN - 81, SECTOR – V, SALT LAKE CITY
Kolkata – 700 091

List of members of the Trade Committee meeting for the trade of “Network Technician” at Central Staff Training & Research Institute (CSTARI), Kolkata on 07th September, 2012.

Sl. No.	NAME & DESIGNATION S/Shri./Smt.	ORGANISATION	REMARKS
1.	R.N. Bandyopadhyaya, Director	CSTARI, Kolkata	Chairman
2.	Peter Kujur, Trg. Officer	DTE&T, Orissa	Member
3.	Jagajiban Maharana, Asst. Trg. Officer	DTE&T, Orissa	Member
4.	Swagata Dey , Faculty	DON BOSCO SERI, Howrah	Member
5.	L.K. Mukherjee, Dy. Director of Trg.	CSTARI, Kolkata	Member
6.	N. Nath, Asst. Director Trg.	CSTARI, Kolkata	Member
7.	Ramesh M.S., Asst Director Trg.	DET, Bangalore	Member
8.	Santanu Ghosh, Instructor	DIT, West Bengal	Member
9.	Amit Mondal, Asst Director	SOFTNIK, Kolkata	Member
10.	Sushedip Konar, Director	SOFTNIK, Kolkata	Member
11.	Kabindra Kundu	NOVEL R&D INDIA (P) Ltd.	Member
12.	Nilay Chakraborty	Fortuneer Tillage Service Ltd., Kolkata	Member
13.	Dibeyendu Paul, Director	PTIMA, Kolkata	Member
14.	S. Ranganathan, Chief Adm. Officer	MERIT Pvt. ITI	Member
15.	Pinoy Mondal, IT Network	ON TRADE INDIA Ltd. Kolkata	Member
16.	Somasheker, Principal	NVTI, Bangalore	Member
17.	Sarbojit Neogi, Instructor	R.V.T.I. (W) Kolkata	Member
18.	Dr. R.K. Datta, Director	MERIT Pvt. ITI	Member
19.	Pranav Viswanathan, Senior Engineer	TETWA, Bangalore	Member
20.	U.S. Bhaduri, Sr. DGM	ECIL, Kolkata	Member
21.	S. Maiti, Consultant	ECIL, Kolkata	Member
22.	Aninda S Goswami, Director	Modern Academy Of Industrial Training, Chandrakona Town	Member
23.	Sanjay Kant, Jt. Director of Trg.	R.D.A.T., Kolkata	Member
24.	N. Bhattacharya, Ex. DDIT	DDIT, West Bengal	Member
25.	S.B. Sardar, Asst. Director Trg.	CSTARI, Kolkata	Member
26.	Rajib Kumar Das, Asstt. Director	STPI, Kolkata	Member
27.	Anupam Chanda, Sr. Engineer	CDAC, Kolkata	Member
28.	Goutam Das Mondak, Principal	RVTI, Kolkata	Member
29.	B.K. Singha, Dy. Director of Trg.	CSTARI, Kolkata	Member
30.	Indranil Samaddar	INTEL, Kolkata	Member
31.	Kalyan Dutta, Director	Doordarshan, Kolkata	Member
32.	Arindam Kar, GM	Novatium Solution (P) Ltd.	Member
33.	Subrata Rudra Paul, .Engineer	Myriad Network, Kolkata	Member
34.	SK. Altaf Hossain, Trg.Officer	ATI, Kolkata	Member
35.	R.N. Manna, Trg.Officer	CSTARI, Kolkata	Member
36.	Mohan Singh, Trg.Officer	CSTARI, Kolkata	Member
37.	Prasoon Ghosh, Sr. D'man	CSTARI, Kolkata	Member
38.	H.Kujur, Jr.D/Man	CSTARI, Kolkata	Member
39.	P.Biswas, Jr.D/Man	CSTARI, Kolkata	Member

List of members attended the Workshop to finalize the syllabi of existing CTS into Semester Pattern held from 6th to 10th May'2013 at CSTARI, Kolkata.

Sl. No.	Name & Designation	Organisation	Remarks
1.	R.N. Bandyopadhyaya, Director	CSTARI, Kolkata-91	Chairman
2.	K. L. Kuli, Joint Director of Training	CSTARI, Kolkata-91	Member
3.	K. Srinivasa Rao, Joint Director of Training	CSTARI, Kolkata-91	Member
4.	L.K. Mukherjee, Deputy Director of Training	CSTARI, Kolkata-91	Member
5.	Ashoke Rarhi, Deputy Director of Training	ATI-EPI, Dehradun	Member
6.	N. Nath, Assistant Director of Training	CSTARI, Kolkata-91	Member
7.	S. Srinivasu, Assistant Director of Training	ATI-EPI, Hyderabad-13	Member
8.	Sharanappa, Assistant Director of Training	ATI-EPI, Hyderabad-13	Member
9.	Ramakrishne Gowda, Assistant Director of Training	FTI, Bangalore	Member
10.	Goutam Das Modak, Assistant Director of Trg./Principal	RVTI, Kolkata-91	Member
11.	Venketesh. Ch. , Principal	Govt. ITI, Dollygunj, Andaman & Nicobar Island	Member
12.	A.K. Ghate, Training Officer	ATI, Mumbai	Member
13.	V.B. Zumbre, Training Officer	ATI, Mumbai	Member
14.	P.M. Radhakrishna pillai, Training Officer	CTI, Chennai-32	Member
15.	A.Jayaraman, Training officer	CTI Chennai-32,	Member
16.	S. Bandyopadhyay, Training Officer	ATI, Kanpur	Member
17.	Suriya Kumari .K , Training Officer	RVTI, Kolkata-91	Member
18.	R.K. Bhattacharyya, Training Officer	RVTI, Trivandrum	Member
19.	Vijay Kumar, Training Officer	ATI, Ludhiana	Member
20.	Anil Kumar, Training Officer	ATI, Ludhiana	Member
21.	Sunil M.K. Training Officer	ATI, Kolkata	Member
22.	Devender, Training Officer	ATI, Kolkata	Member
23.	R. N. Manna, Training Officer	CSTARI, Kolkata-91	Member
24.	Mrs. S. Das, Training Officer	CSTARI, Kolkata-91	Member
25.	Jyoti Balwani, Training Officer	RVTI, Kolkata-91	Member
26.	Pragna H. Ravat, Training Officer	RVTI, Kolkata-91	Member
27.	Sarbojit Neogi, Vocational Instructor	RVTI, Kolkata-91	Member
28.	Nilotpala Saha, Vocational Instructor	I.T.I., Berhampore, Murshidabad, (W.B.)	Member
29.	Vijay Kumar, Data Entry Operator	RVTI, Kolkata-91	Member

GENERAL INFORMATION

- 1. Name of the Trade** : Network Technician
- 2. N. C. O. Code No .** :
- 3. Duration** : 06 Months (1 Semester)
- 4. Power Norms** : 5 KW
- 5. Space Norms** : 56 Sq. m
- 6. Entry Qualification** : passed 10th Class examination
- 7. Unit size (No of student)** :16 Trainees
- 8. Instructor's/Trainer's Qualification** : Academic - 10th Class pass or equivalent
Technical - (i) Degree in Engineering from Recognized university or Three year Diploma from recognized Board / Institution in appropriate branch of trade concerned or National Apprenticeship Certificate or National Trade certificate in relevant trade
Experience – One year for Degree holder, Two years for Diploma holders and Three year for NAC / NTC holders
- 9. Desirable qualification** : Preference to be given CIC (Craft instructor Certificate) holders.

At least one Instructor must have Degree / Diploma in relevant field

**Syllabus for the trade of “Network Technician” Under Craftsmen Training Scheme
Duration: Six Months**

First Semester

Semester Code:NET: SEM I

Week No.	Trade Practical	Trade Theory
1	<p>Visit to different sections of the Institute. Safety precautions, Electrical Safety. Demonstration and operation of Fire Extinguishers. Demonstration of Artificial Respiration. Safety and occupational health: Effects of Cramped room and ill-light working environment. Effects of improper sitting posture. Effects of improper lifting of posture of Heavy Components Electric shock for the user due to electrical problem. Software Hardware security Password, Locked Room, Sealed PC, User last Modified</p> <p>Environment: Pollution of environment due to e-waste. Waste recovery facility through inter industry exchange. Removing Dust particles on the keyboard and other components.</p>	<p>Familiarization with the Institute. Accidents, Safety precautions, Electrical safety. Types of fire extinguishers. Artificial Respiration. First Aid- Global warming-</p>
2	<p>Visit to establishments with general purpose and special purpose computers. Visit to Computer centers installed with Mini and Micro computers. Familiarisation with different type of Computers. Type of applications, operating systems, Software use in the establishments. CMOS Setup, HDD Types, IRQ, Boot sequence, Passwords-User and Supervisor</p>	<p>Basic definition of computer, features and applications, hardware, software, firmware and live ware. Data, Information, data types, physical & logical concepts of data. Representation of information inside a computer - Bit, byte, kilobyte, megabyte and gigabyte. Generation of Computers – Classification of computers according to purpose (general and special purpose), according to working (analog, digital and hybrid), according to processing capability (Super, mainframe, mini, micro, laptop and palmtop). Concept of Blue Tooth. Data processing – Different types of data processing like centralized,</p>

		Decentralized & Distributed Data Processing, Server, Different types of servers
3	<p>Identification of different peripheral devices. Practice of soldering.</p> <p>Connecting and dismantling cords, cables and peripheral devices.</p> <p>Identifying and handling of different types of Latest removable storage devices and CDs/DVDs .</p> <p>Understanding the keys and their functions in keyboard.</p> <p>Keyboard operation and practicing mouse.</p> <p>Connecting different types of peripherals- Installing different types of Printer-</p>	<p>Block diagram of a Computer system. Standard and common input/output devices.</p> <p>Processing unit – CPU, ALU, CU</p> <p>Memory unit – Primary and Secondary memory. Concept of Virtual memory. Semiconductor memories such as RAM, ROM, PROM, EPROM, EEPROM.</p> <p>Dynamic and Static RAM. L1 and L2, L3</p> <p>Cache Memories.</p> <p>Buses – Control bus, Address bus and Data bus.</p> <p>Secondary storage devices – magnetic tapes, Latest removable storage devices, hard disk, CDs and DVDs.</p>
4	<p>Booting the computer under DOS and Windows.</p> <p>Using different computer peripherals.</p> <p>Self-test for different Printers.</p> <p>Keyboard and mouse practice.</p>	<p>Computer peripherals – Different type of printers, scanners, mouse, cameras, bar code readers etc.</p> <p>Power On Self Test (POST).</p> <p>Booting – booting sequence, cold booting and warm booting. Booting files and their functions. Concept of LILO boot.</p> <p>Storage & retrieval of data – concept of tracks, sectors, blocks, cylinders, boot record, disk partitions, Master Boot Record (MBR and File Allocation Tables (FAT and NTFS).</p> <p>Types of software – system software & application software. Functions of operating system, interpreter, compiler and assembler.</p>
5	<p>Introduction to Windows – The user Interface, Using Mouse, Status Bar, Start, Menus, Running Applications, My Computer, Recycle Bin, Windows Explorer, Creating, Renaming, Copying & Moving files and folders. Using Help.</p> <p>Windows Settings – Control Panel, Setting Wall paper, Screen Savers, Date, Time, Sounds, Task bar and Start Menu. Using right mouse button.</p>	<p>MS Windows –Starting windows and their operations.</p> <p>File management through Windows explorer.</p> <p>Display properties, sound properties, different screen savers, and font management. Installation of programs.</p> <p>Setting, using and applications of control panel.</p>

6	<p>Advanced Windows – Creating shortcuts & folders. Using Accessories, Adding & Removing Components of Windows.</p> <p>Practice of Basic DOS commands for File/Directory manipulations, Copying and Moving and File/Directory manipulations.</p>	<p>Applications of essential accessories - such as notepad, WordPad, paintbrush, images, calculator, calendar, media players and sounds. Multimedia.</p> <p>Basic DOS – Comparison of DOS & Windows, Switching between DOS & Windows. Basic DOS commands for File/Directory manipulations, Copying of Files & Disks, Delete/Undelete.</p>
7	<p>Motherboard – Study of different Buses, Processor sockets and RAM sockets on Motherboards. Identification of different types of RAM and their sockets. Programming and resetting CMOS and making front panel connections. Replacing BIOS and battery. Identification of different types of RAM and their sockets. Installing and extending RAM. PXE booting / Remote booting</p>	<p>Computer hardware – Different type of Motherboards, on-board features, form factors. Different type of Buses – ISA, EISA, VESA, MCA and PCI. Different type of Processors, sockets, RAMs their features, capacities, frequency and advantages. Functions of I/O Ports and Motherboard BIOS.</p>
8	<p>Expansion Cards - Identification, checking and installing of AGP and different expansion cards commonly used. Installation and checking of Network Interface Card (NIC). Hard Disks and CD / DVD Drives. Partitioning and formatting of Hard Disks. Master/Slave configuration of Hard disks and CD / DVD Drives.</p>	<p>Function and features of different add on cards, Display cards, AGP and NIC. Different types of Hard Disks and CD / DVD Drives and their connections. DOS - different versions, advantages, features and applications. Windows - different versions, advantages, features and applications of windows.</p>
9	<p>Installation of Operating Systems – DOS, Windows XP / Vista / 7 or any other latest version and Unix/Linux. Installation of network Operating system and basic network configuration. Identification of Network tropologies, network devices, types of protocols used, types and network media used.</p>	<p>Introduction to Computer Networks – Advantages of Networking, Peer-to-Peer and Client/Server Network. Network Topologies – Star, Ring, Bus, Tree, Mesh, Hybrid. Type of Networks – Local Area Networks (LAN), Metropolitan Area Networks (MAN), Wide Area Networks (WAN) and Internet, Wthernet, Wi-Fi, Mobile Networking, Wire and wireless Networking. Diffrence between Intranet and Internet.</p>
10 to 11	<p>Installing & Configuring a Peer-to-Peer Network using Windows Software. Making cables by crimping.</p>	<p>Communication Media & Connectors – Unshielded twisted-pair (UTP), shielded twisted-pair (STP) and coaxial cable: RJ-45, RJ-11, BNC. Crimping and making cables.</p>

12	Installing & Configuring Windows 2003 / latest Linux based Server.	Introduction to Data Communication – Analog and Digital Signals, Simplex, Half-Duplex and Full-Duplex transmission mode.
13	Installing & Configuring Novell Netware Server.	Network Components – Modems, Hubs, Bridges, Routers, Gateways, Repeaters, Transceivers, Switches, Access point, etc. – their functions, advantages and applications.
14	Structured cabling and using I/O Box. Setting up Nodes.	OSI Model - The functions of different layers in OSI model
15 to 16	Physically connecting and running the Network. Troubleshooting the Network.	Data transmission in the OSI Model. Protocols IPX/SPX. Troubleshooting the Network.
17 to 18	Configuring Print Server. Network Administration Functions. Identification and using the Network components. Cascading Hubs.	Ethernet operation. Ethernet characteristics. Ethernet cabling and components – Thick Net, Thin Net and 10 Base T. Limitations and Advantages of Ethernet. 10 G Network.
19	Exposure and using Internet.	Internet – Architecture and History. The Internet Architecture Board. Various Applications of Internet.
20	Installing and Configuring Internet Connection on a PC using PSTN.	TCP Transmission Policy, and Congestion Control.
21	Installing and Configuring Internet Connection on a PC using ISDN.	TCP/IP Reference Model – Different layers and their functions. Comparison of the OSI and TCP Reference Models.
22to 23	Installing and Configuring Internet Connection on a PC using ISDN. Installing Proxy Server. Setting E-mail accounts.	Simple Mail Transfer Protocol (SMTP), Telnet, File Transfer Protocol (FTP), Hyper Text Transfer Protocol (HTTP), Simple Network Management Protocol (SNMP).
24	Virtual Networking Practice through simulators.	
25	Revision	
26	Examination	

Note : Syllabus for the subject of Social Studies is common for all the trades.

TRADE: Network Technician
LIST OF TOOLS & EQUIPMENT

A. TRAINEES TOOL KIT FOR 16 + ONE TRAINEES

Sl. No.	Name of the Items	Quantity
1	Laptop : i3 2 nd generation processor or equivalent and above with major minimum features as below:- 1) Speed :- 2.1 GHz or Higher. 2)Cache Memory : - Minimum 3 MB or better. 3)RAM :- 4 GB DDR-III or Higher. 4)Hard Disk Drive :- 500GB or Higher,5400 rpm(minimum) or Higher, WiFi Connectivity. 5) Network Card : Integrated Gigabit Ethernet(10/100/1000). 6) Paper Licensed Operating System / OEM Pack(Preloaded). 7)Antivirus / Total Security – 01 NO.	1No.
2	Server for LAN – As Required. Latest 32/64 bit processor or Higher with PCI Express Video Card 4GB VRAM 4 GB RAM expandable 19" TFT Keyboard, Mouse, DVD OR BLU-RAY WRITER with latest Paper license of OS - Server Edition Internet, Antivirus / Total Security - Server Edition & UPS for Power Back up.	1 no
3	WORKSTATION/NODES : 2 nd Generation Core i3 Processor or Equivalent and above with major minimum features as below : 1) 32/64 Bit Processor (3.06 GHz or Higher,4 MB 4-Core) or Higher. 2) Network Card : Integrated Gigabit Ethernet(10/100/1000). 3) RAM : 2 GB/ 4 GB DDR3 or Higher. 4) 320 GB / 500 GB HDD or Higher. 5) 19" TFT Monitor / Higher 6) DVD Writer 7) PS2 / USB KeyBoard , USB/Optical Mouse with latest Paper Licensed Operating System / OEM Pack(Preloaded) Professional/Ultimate Edition with Internet Facility.	8 nos
4	Network Terminator (NT1) /Switch	1 no.
5	Terminal Adapter (TA)/Switch	1 no.
6	Laser Printer (One Network Printer)	2 nos.
7	Inkjet Printer (Multifunctional)	1 no.
8	Different Expansion Cards	1 each
9	24 port Switch /Router	1 no each
10	500 VA or higher off – line UPS FOR NODES and server	11 No's
11	Air Conditioner 1.5 ton.	2 nos.
12	Modem (Internal & External)	2 nos. each
13	Broad Band connection	1 no.
14	Telephone Line	1 no.
15	CD / DVD Writer	2 nos.

16	Network Interface Card (Ethernet Card 10/100/1000 Mbps)	4 nos
17	Fire extinguisher	1 no.
18	Vacuum Cleaner (For All Computer Related Courses.)	1 no.
19	LCD / DLP projector	1 no.
SOFTWARE		
1	Network O.S. with minimum 10 User license (Latest version)	1 no.
2	Windows (XP / Vista / 7) / Latest (10 User license) or Equivalent	1 no.
3	Network Simulation Software (10 User license)	1 no.
FURNITURE		
1	Computer Tables with Chairs/stools	16 nos.
2	Printer Tables	02 nos.
3	Instructor Table	01 no.
4	Instructor's Chair	01 no.
5	Cabinet with drawer	02 nos.
6	Pigeon hole cabinet – 20 compartments	01 no.
7	Steel Almirah big size	01 no.
8	Steel Almirah small size	02 nos.
9	Class room chairs with writing pad molded type	16 nos.
10	4-Unit Rack for installation of Patch Panel, Hubs/Switch / Router etc.	2 nos.
STUDENTS TOOL KIT		
1	Screwdriver Set of min. 5 bits (Combination of star & minus) + 1 ext. rod	01 no. each
2	Crimping Tool for BNC and RJ-45 connectors	01 no. each
3	Punching Tool	01 no. each

Note : Some of Course Related CBTs may be purchased (Optional)

NOTE- LATEST VERSION OF HARDWARE AND SOFTWARE should be provided.