Annexure – IV

Syllabus of CCCN

About the Course

The course has been designed to fulfill Networking requirements of Industries. The contents of the course include Network Hardware Troubleshooting, protocols and Networking with Windows 2003, Windows XP, Vista, Windows 7, Linux, Routing, Wireless Network, System etc.

This course is Job Oriented course and designed to produce networking professionals capable of implementing, administering, maintaining Networks and overall Systems. It is an advanced level program that measures the ability to administer in network problems , This program has been designed to keep in mind that in now day's scenario Diploma/'O'Level/'A' Level / PGDCA/ BCA/B.E./B.Tech/MCA.

Outline of Syllabus for CCCN

Module-1	BASIC NETWORK
Module-2	ADVANCE & WIRELESS NETWORKING
Module-3	OPERATING SYSTEM ADMINISTRATION
Module-4	I.T. SECURITY CONCEPTS

Detailed Syllabus

Module-1 BASIC NETWORK

1. **Data Communication and Networks :**

   Data Communications, Data Representation, Networks, Physical Structure, Element, Network Relationship, Learning Network Features, Types of Network, Topologies, Elements and Network Operating System.

2. **Networking Protocol & Hardware:**

   Protocols and Standards, Network Model, Layered Tasks, TCP/IP Protocol Suite, TCP/IP and UDP, Addressing, Comparison of OSI & TCP/IP Model. **Network Hardware:** NIC, Repeater, HUB & Concentrators, Switches, Bridge, Router, Gateway etc.

3. **Media Layer & Communication:**

   LAN Characteristics, Guided/ Unguided Transmission Media and Component, MAC Sub layer, Framing, Token Ring, FDDI & Ethernet, Types Of Ethernet, Error detection and correction , Data link layer Protocol , ARP, RARP, Role of Network layer, Network Layer Design Issues, Routing and Algorithms, Network Layer in the Internet, Comparison with other Layer, IP address, Basics of Sub-netting/ Masking and Network Layer Protocol. VLAN Basics, Protocols and Configuration, Router elements and configuration.

4. **Host Layer Data Delivery:**

   Transport Layer and Protocols, TCP /UDP Comparison, Port and Socket Addressing, Flow Control and Buffering, Multiplexing, Error detection and correction, Dialog, Session and Authentication management, Token and Synchronization, Encrypting and compressing data, Application level Protocol, The Domain name system, Electronics Mail, the World Wide Web, FTP, Telnet, HTTP, DHCP etc.

5. **Switching and Making WAN Connection:**

Switching, Circuit, Massage and Packet Switching, Datagram Network, Virtual-Circuit Networks, Determining WAN need, WAN connection types including POTS, ISDN, DSL/ADSL, Dial-up, Leased line, Wi-Fi, Wi-MAX, Satellite, Cell phones, Broadband over power line, ATM etc.

Module-2 ADVANCE & WIRELESS NETWORK

1. **Overview of Wireless Network**
Introduction to wireless Network, different generation of Wireless System

2. **Characteristics of Wireless Medium**
Radio propagation mechanisms; reflection, diffraction and scattering, multipath & Doppler

3. **Physical Layer Alternatives for Wireless Networks**
Wireless transmission techniques, Consideration in the design of wireless Modem, Short Distance Base Band Transmission, Comparison of modulation themes, Coding techniques for wireless communications.

4. **Wireless Medium Access Alternatives**
Introduction to multiple access technique, Frequency Division Multiple Access (FDMA) and Time Division Multiple Access (TDMA),. Code Division Multiple Access (CDMA), Comparison of CDMA, TDMA, FDMA, Random Access Methods for mobile Data Services, Access methods for wireless LANs.

5. **Network Planning**
Wireless network topologies, cellular topology, cell fundamentals, capacity expansion techniques, network planning for CDMA systems.

6. **Introduction to Wireless LAN**
Evaluation of WLAN, Wireless Home Networking, IEEE 802.11 standard for WLAN,

7. **GSM and TDMA Technology:**
What is GSM? GSM Services and features, system architecture, Call Establishment Mechanism, Handover Mechanism, Security Mechanism.

8. **CDMA Technology:**
What is CDMA? CDMA Forward channel, CDMA Reverse channel, packet & frame formats, mobility management,

9. **Mobile Data Networks:**
What is mobile Data?, GPRS, Mobility Support in GPRS, Short Messaging Service in GSM, Wireless Application Protocol (WAP),

10. **Bluetooth Technology**:
Introduction to Bluetooth technology, Overall architecture, protocol stack, physical connection, MAC mechanism, connection management,

11. **Overview of Wireless Broadband Networking**
Planning and designing wireless Broadband, satellite communications and application.

Module-3 OPERATING SYSTEM ADMINISTRATION

Windows Operating System

1. **Introduction to Windows Operating System**
   Windows 2003 Server, System Requirement, Architecture, Groups, Domains and Active Directory.
2. **Installation and Configuration**
   Hardware Requirement, Preparation for Installation, Disk Partitioning, Dual Booting Feature, Remote Installation Server, Troubleshooting during Installation.
3. **Installation and Managing Active Directory**
   Understanding feature of Active Directory, Structure, Naming Convention, Window 2003 Domain Organizational Units, Installing Active Directory, Controlling Access to Active Directory, Locating Objects Inactive Directory and Administration of Active Directory Objects.
4. **Managing and Securing Resources**
   Configuration of Hardware Devices, APM, Working with File System, Up-gradation of Hard Disk, Backup Strategy, Managing Users Account and Profiles, Managing Group Accounts, System Policy and Group Policy, Monitoring Disk Quotas, Auditing, Configuring and Scheduling Printer Tools, Setting Up of IIS Web Server, SQL Server and Exchange Server.
5. **Performance and Maintenance**
   Monitoring Performance using System Monitor, Setting up of Services, Recovering from Disk Failure.

LINUX OPERATING SYSTEM

1. **Introduction to Linux**
   Development of Linux, Various Distribution of Linux, Linux System Concepts- Directory Structure and File Structure.
2. **Linux Installation**
   System Requirement, Different types of Installation- CD ROM, Network and quick Start, Different types of Linux Installation Server, Workstation and Customs, Disk Partitioning Auto and Manual, Boot Loader, Packet Selection, Network and Authentication Support.
3. **Booting Procedures**
   LILO / GRUB Configuration, Server Security, Run Level, Initialization Script, Devices Initialization and their Access, Set Down Procedures.
4. **Linux Commands and Shell Programming**
   Concepts of Processes, Commonly used user Commands, vi Editor, Various Shells and Shell Programming.
5. **System Administration**
   Services- Initialization and Status, Creating and Maintaining of User Account, and Group Account, Disk and Device Management, Backup Concepts, Installation and Maintenance of various Servers Apache, Squid, NFS, DHCP, NIS and Printer Server.
6. **X Windows**
   Introduction, Installation and Configuration of X Windows, Working with X- Windows GNOME, KDE, Window Manager.
7. **Performance Tuning**
   Logrotate, Backup Strategy, Study of various Services for Performance Tuning, Enhancement and Optimization.

Module-4 I.T. SECURITY CONCEPTS

1. **Basic Of Security**
   Information Security :Need for computer security, Hacking, Security mechanisms, Prevention, Policy management, Security threats: Threats, Vulnerabilities, Attacks Snooping, Malicious code, Security of Hard drives, laptops & mobile devices, Cryptography : Symmetric versus asymmetric cryptography, application of cryptography, Identification and Authentication, Network Security Infrastructure, Security Tools and Technologies. Overview of Risk Assessment and Disaster Recovery.

2. **WWW Security**
   Browser Security: Cookies, Java Script, ActiveX, Applets, Buffer overflows, Anonymous surfing, Phishing, HTTP/S, SSL/TLS, E-mail Security: POP3,IMAP, Encrypting and signing messages, S/MIME, PGP, Vulnerabilities Spam, E-mail hoaxes, Wireless Security: Ad-hoc network and sensor networks, WTSL, 802.11 and 802.11x, WEP/WAP.

3. **Infrastructure security**
   Internet infrastructure, key components in the internet infrastructure, Switch Security, Router security: External and internal attacks, RIP attacks and countermeasures, OSPF attacks and countermeasures, BGP Attacks and countermeasures, other attacks and filtering techniques: DHCP attacks and filter, DNS attacks.

4. **Threats Security**
   Detection: Static Methods, Scanners, Static Heuristics, Integrity Checkers, Dynamic Methods, Behavior Monitors/Blockers, Emulation, Comparison of antivirus techniques, Retroviruses, Entry point obfuscation, Anti-Emulation, Armoring , Tunneling, Avoidance, Deworming, defense, capture and containment (Honey pots, Reverse Firewalls, Throtting), Automatic Counter measures.

5. **Wireless Security**
   Traditional Wireless Networks Security: Key Establishment, Anonymity, Authentication, Confidentiality, Data Integrity and Loopholes in 802.11, Security in Wireless Ad-hoc Network: Key Establishment, Authentication, Confidentiality, Integrity Protection, Enabling Security Features on a Linksys WAP 11802.11b Access, Implementing Wi-Fi Protected Access (WPA).