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:

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, Message 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

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

4. Managing and Securing Resources

5. Performance and Maintenance
   Monitoring Performance using System Monitor, Setting up of Services, Recovering from Disk Failure.

LINUX OPERATING SYSTEM

1. Introduction to Linux

2. Linux Installation

3. Booting 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

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

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, WTLS, 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, Retraviruses, Entry point obfuscation, Anti-Emulation, Armoring, Tunneling, Avoidance, Deworming, defense, capture and containment (Honey pots, Reverse Firewalls, Throttling), Automatic Counter measures.

5. Wireless Security