

CERTIFICATION IN COMPUTER NETWORKS



Course Code : OCIT0023

In the last few decades, computers have become part of our everyday lives. This is possible because computer networking and data communications are modifying the way we do business transactions and also the way we live. This course on computer networks will help you understand the technology used by the networks. The course focuses on configuring, managing and troubleshooting components of the basic network infrastructure. It also explains the architecture, functions, network components, standards of IP addressing, protocols, models of the Internet and troubleshooting of network problems. In this course, students will learn the basics of networking and fundamental layered structure and their services, examine protocols and algorithms used to operate the network and how to troubleshoot problems.

Curriculum

Module 1: Networking Fundamentals

Basics of network & networking, Advantages of networking, Types of networks, Network terms- Host, Workstations, Server, Client, Node, Types of network architecture: Peer-to-Peer & Client/Server, Workgroup vs. Domain. Network topologies, Types of topologies, Logical and physical topologies, selecting the right topology, Types of transmission media, Communication modes, Wiring standards and cabling: Straight-through cable, Crossover cable, Rollover cable, Media connectors

Module 2: Basics Of Network Devices

Network Devices- NIC - functions of NIC, Installing NIC, Hub, Switch, Bridge, Router, Gateways and other networking devices, Repeater, CSU/DSU and modem, Data link layer: Ethernet, Ethernet standards, Ethernet components, Point-to-Point protocol (PPP), PPP standards, Address resolution protocol, Message format, Transactions, Wireless networking.

Module 3: Basics of Network, Transport and Application Layers

Network layer: Internet Protocol (IP), IP standards, Versions, Functions, IPv4 addressing, IPv4 address classes, IPv4 address types, Subnet mask, Default gateway, Public & Private IP address, Methods of assigning IP address, IPv6 Address, Types, Assignment, Data encapsulation, the IPv4 Datagram format, the Ipv6 Datagram format, Internet Control Message Protocol (ICMP), ICMPv4, ICMPv6, Internet Group Management Protocol.

Module 4: Wan Technology

What is a WAN?, WAN switching, WAN switching techniques circuit switching, Packet switching etc., Connecting to the internet: PSTN, ISDN, DSL, CATV, Satellite-Based services, Last Mile fiber, Cellular technologies, Connecting LANs: Leased lines, SONET/SDH, Packet switching, Remote access: Dial-up remote access, Virtual private networking, SSL VPN.

Module 5: Network Operating Systems and Troubleshooting Network

Network operating systems: Microsoft operating systems, Novell NetWare, UNIX and Linux operating systems, Macintosh networking, Troubleshooting networks: Command-line interface tools, Network and internet troubleshooting, basic network troubleshooting: Troubleshooting model, Identify the affected area, Probable cause, Implement a solution, Test the result.

Learning Outcomes

- Identify the basic differences between various types of networks.
- Identify the advantages and disadvantages of network devices used in various layers
- Select the right topology based on the requirements
- Identify the functions of ARP and RARP
- Analyse ICMP messages to test connectivity
- Differentiate between switching and routing