

# Certificate in Introduction to Computer Networks

**Proposed Duration: 03 Months Per**

**Total no. of Hours: 48 Hours**

## Course Introduction

Computer networking classes combine lectures and hands-on practice to provide skills in computer network system configuration. Courses may include discussions, lectures and projects that deal with basic networking principles and current developments in the field. Computer networking courses train students to connect local area networks (LAN), wide area networks (WAN) and wireless versions of both types. They also learn to connect hardware devices and set up Internet access. These skills can apply to a variety of careers. According to the skills learned in networking classes are valuable to network engineers, programmers and consultants.

## Why This Certificate!

Technology has changed the way we live and work. With rapidly changing networking technology, one must stay updated and keep evolving as per the needs of the job. Employers seek candidates who can build networks, secure devices and manage the network efficiently.

Earning this certification will help you to start a good career in the IT industry. As businesses increasingly depend on complex network infrastructure, this certification proves you have the skills to meet these demands. All above this, the certification is a cornerstone towards the advanced certification C further advancing your career in networking.

## Eligibility for this course

This course doesn't require any previous knowledge or experience. Just familiarity with the computer basics will be enough to start this course. This course is designed for both beginners and experienced professionals, having some knowledge in networking devices will help you to grasp the topics fast C confidently pass the certification exam.

### Targeted Audience

- **Aspiring IT Professionals:** Individuals looking to enter the world of IT and networking through this course.
- **Experienced IT Professionals:** Those seeking to broaden their skills with a recognized networking certification.
- **Networking Engineers:** Professionals aiming to specialize in networking technologies and grow in their careers.

## Career Opportunities after this Course

After completing the certification, there are several career opportunities available in the field of networking and IT. The certification is highly regarded in the tech industry and opens doors to roles that focus on networking, system administration, and technical support. Here are some potential career opportunities:

1. **Technical support engineer:** A technical support engineer is responsible for assisting customers and company employees with solving technical issues with computer devices.
2. **IT Support Specialist:** Provides technical support to end-users, solving hardware, software, and networking issues.
3. **Network Support Engineer:** Provides support for network-related issues, including installation, configuration, and troubleshooting of network hardware and software.
4. **Network Engineer:** Involves designing, implementing, and troubleshooting networks, as well as ensuring that network infrastructure is up to industry standards.
5. **Network Administrator:** Responsible for managing and maintaining computer networks within an organization, ensuring they are secure, stable, and efficient.

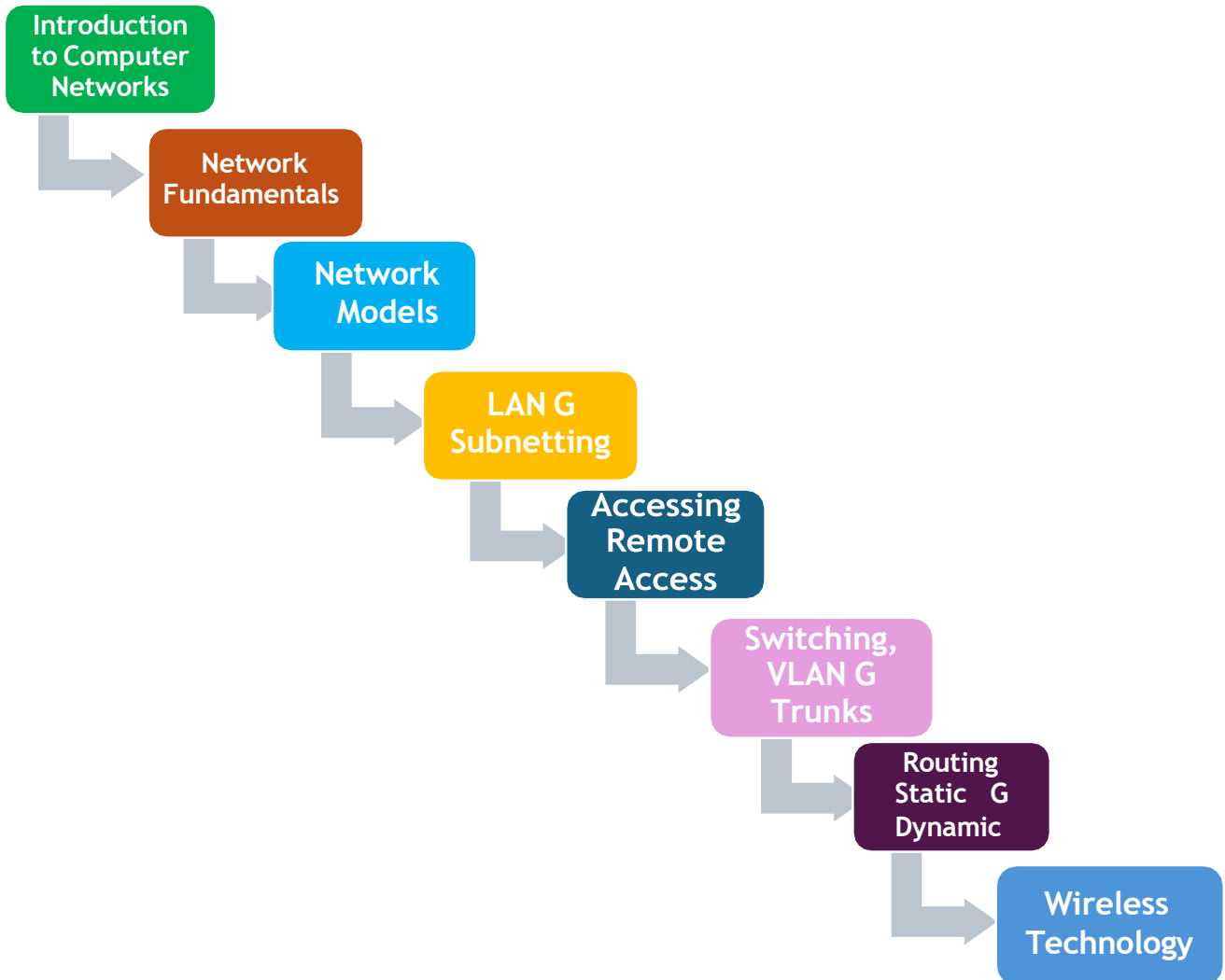
6. **Systems Administrator:** Manages and configures the organization's servers, networks, and workstations.
7. **Cybersecurity Specialist:** Focuses on protecting networks and systems from cyber threats, identifying vulnerabilities, and implementing security protocols.
8. **Network Consultant:** Provides advice and guidance to businesses on the design, implementation, and maintenance of their networks.
- G. **Wireless Network Engineer:** Specializes in the design, installation, and maintenance of wireless networks, including Wi-Fi and other wireless communication systems.

## Next Step Toward Learning

Networking technology has seen tremendous growth in recent years and that trend is likely to continue. Examine a few of the possible future trends, including the widespread expansion of 5G, increased automation through AI advances, and the value of SD-WAN. You can go for the below mentioned certification for your future growth.

1. Certified Network Associate
2. CompTIA Security+
3. CompTIA Network+
4. AWS Certified Advanced Networking - Specialty
5. VMWare Certified Technical Associate - Network Virtualisation (VCTA-NV)

## Elaborated Syllabus for the Course



## Introduction to Computer Networks

- Definition, goals, and characteristics of computer networks
- Need for computer networks (resource sharing, communication, internet access, remote access)
- Network topologies (bus, ring, star, mesh, hybrid, tree)
- Types of networks (LAN, WAN, MAN, PAN, CAN, SAN, EPN)
- Network protocols and standards (IEEE, IETF, ISO)
- Network performance metrics (throughput, latency, jitter, packet loss)
- client-server computing (2-Tier C 3-Tier)

## Network Fundamentals

- Repeaters, hubs, and bridges
- Switches (functions, types, VLANs, Power over Ethernet (PoE))
- Routers (functions, types, routing tables, and configurations)
- Wireless access points (functions, standards, and configurations)
- Types of Transmission media (twisted-pair cables, coaxial cables, fiber optics, wireless media) C its connectors
- Network interface cards (NICs)

## Network Models

- Introduction to network models.
- Introduction to OSI model
- Introduction to TCP/IP model
- Difference between OSI model C TCP/IP model
- Introduction to the protocols over different layers
- Introduction to Internet Protocol (IP) C its versions

## LAN G Subnetting

- Introduction to LANs
- Cables used in network C Various connectors (RJ-45, SFP)
- How a switch learns MAC addresses
- Power over Ethernet (PoE)
- Types of IPV4 Classes C Use of each class in IPv4
- Introduction to Subnetting
- Basics of Binary Numbers
- Subnetting in Binary
- Classless Inter Domain Routing (CIDR)
- Fixed Length Subnet Mask (FLSM)
- Variable Length Subnet Mask (VLSM)

## Accessing Remote Access

- Introduction to telnet
- Introduction to SSH

## Switching, VLAN G Trunks

- Introduction to Switching
- Introduction to VLAN C Trunks
- Access ports C Trunk ports
- Introduction to Inter- VLAN routing
- Introduction to Spanning-Tree
- Types of STP (CST, PVST, PVST+)
- Per VLAN Spanning-Tree
- Spanning-Tree Port States

## Routing Static & Dynamic

- Introduction to routing
- Memories of router
- Types of routing (Static & Dynamic)
- Routing protocols (RIP, OSPF, BGP, EIGRP, and their operations)
- Access Lists
- Network Address Translation (NAT)

## Wireless Technology

- Wireless devices - AP, WLC
- Common standards in wireless
- Basics of Wireless Communication
- Wireless Topologies (BSS, ESS, IBSS)
- Wireless Network Extension Types (Wireless Repeater, Workgroup Bridge, Outdoor Bridge, Mesh Network)
- What is radio frequency & how it works
- WLAN Frequency Bands
- Differences Between 2.4 GHz and 5 GHz