# Networking

## Course Modules & Topics

### □ Module 1: Introduction to Networking

- What is a Network?
- Types of Networks: LAN, WAN, MAN, PAN
- Topologies: Star, Ring, Bus, Mesh
- OSI Model vs TCP/IP Model (Layers Explained)

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### 📡 Module 2: Network Devices and Components

- Routers, Switches, Hubs, Bridges
- Network Interface Cards (NICs)
- Cables: Coaxial, Twisted Pair, Fiber Optic
- Wireless Access Points

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### 🌐 Module 3: IP Addressing and Subnetting

- IPv4 Addressing and Classes
- Public vs Private IPs
- Subnet Masks and Subnetting
- Introduction to IPv6

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## 📪 Module 4: Protocols and Communication

- TCP vs UDP
- HTTP, HTTPS, FTP, SMTP, IMAP, POP3
- DHCP, DNS, ARP, ICMP
- Port Numbers and Services

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## 🔒 Module 5: Network Security Fundamentals

- Firewalls and VPNs
- Common Threats: DDoS, Phishing, MITM
- Introduction to Encryption (SSL/TLS)
- Antivirus, IDS, and IPS Systems

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## 🛠️ Module 6: Network Tools & Utilities

- Ping, Traceroute, nslookup
- ipconfig/ifconfig, netstat
- Wireshark (Packet Analysis Basics)
- Network Troubleshooting

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## 🏢 Module 7: Wireless Networking

- Wi-Fi Standards (802.11 a/b/g/n/ac/ax)
- Wi-Fi Channels and Frequencies
- Security: WPA2, WPA3
- Setting Up a Secure Wireless Network

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## 🖧 Module 8: LAN, VLAN & WAN Technologies

- Setting up a Local Area Network
- Understanding VLANs and Trunking
- WAN Technologies: MPLS, Leased Lines, Broadband
- Network Address Translation (NAT)

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## ☁ Module 9: Introduction to Cloud & Virtual Networking

- Virtual LANs and Network Virtualization
- SDN (Software Defined Networking)
- Basics of Cloud Networking (AWS VPC, Azure VNets)
- Hybrid and Multi-Cloud Networking Concepts

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## □ Module 10: Capstone Project

- Design a Network for a Small Business or Organization
- Include Topology, IP Plan, Device Configuration
- Security and Troubleshooting Plan
- Documentation and Presentation