Introduction to Networks & CCNA 2026

Introduction:

This course provides a comprehensive introduction to networking fundamentals as aligned with the Cisco CCNA (Certified Network Associate) certification path. Through hands-on labs, theory, and guided Packet Tracer simulations, students will gain practical skills in configuring and troubleshooting networks using routers, switches, IP addressing, and core protocols. The course is tailored to match current industry demands and prepare participants for real-world scenarios and certification exams.

You must know!

Hours:
40 academic hours

Our lecturers:
INT College has a faculty of instructors and training experts, leading in their fields, with extensive practical experience in applying and teaching the subjects in the hi-tech industry in Israel and worldwide.

Eligibility for INT College's Certificate:
An INT College certificate will be awarded to graduates who meet the course's regulations, submit all exercises and assignments, and attend at least 85% of the lessons.

Target Audience:

This course is ideal for aspiring network professionals, IT support staff, computer science students, and individuals preparing for the Cisco CCNA certification. No prior experience in networking is required, but basic computer literacy is recommended.

Prerequisites:

No prior networking experience is required. Participants should have basic computer skills, including working with files, using the command line, and navigating system settings. Familiarity with general IT concepts is helpful but not mandatory.

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Course Objectives:

- Understand the fundamental principles of computer networking.
- Gain hands-on experience configuring routers, switches, and end devices.
- Learn and apply IPv4 and IPv6 addressing, subnetting, and routing.
- Explore core networking protocols and models, including TCP/IP, OSI, ICMP, and ARP.
- Practice configuring VLANs, DHCP, NAT, and wireless networks.
- Build troubleshooting skills using real-world scenarios and Packet Tracer simulations.
- Prepare for Cisco CCNA certification with aligned theoretical and practical knowledge.

Course Topics:

1. Networking Today

- Introduction to networks
- Network components and types
- LAN, WAN, and Internet overview
- Packet Tracer practice: Exploring basic network topologies

2. Basic Switch and End Device Configuration

- Initial switch setup
- Configuring hostnames, banners, and passwords
- Basic IPv4 addressing
- Packet Tracer practice: Switch configuration & device connectivity

3. Protocols and Models

- OSI and TCP/IP models
- Encapsulation and data flow
- Protocols in network communications
- Packet Tracer practice: Data flow simulation using simulation mode

4. Physical Layer

- Network media types
- Cable standards and connectors
- Bandwidth and latency concepts
- Packet Tracer practice: Media selection and interface setup

5. Number Systems

- Binary, decimal, and hexadecimal
- IP address conversion
- Subnetting preparation
- Packet Tracer practice: Binary conversion tools

6. Data Link Layer

- MAC addressing
- Frame structure
- Ethernet and switch operation
- Packet Tracer practice: MAC address learning in switches

7. Ethernet Switching

- Switch forwarding process
- Collision & broadcast domains
- Full-duplex vs half-duplex
- Packet Tracer practice: Switch topology with collisions & broadcasts

8. Network Layer

- IP packet delivery
- Routing concepts
- Role of routers
- Packet Tracer practice: Basic routing exploration

9. Address Resolution

- ARP and DNS
- Static and dynamic resolution
- Packet Tracer practice: ARP table observation and testing

10. Basic Router Configuration

- Initial router setup
- Interfaces, passwords, banners
- IPv4/IPv6 configuration
- Packet Tracer practice: Router configuration lab

11. IPv4 Addressing

- Classes of IPv4
- Private vs public IPs
- Address assignment
- Packet Tracer practice: Manual IP configuration

12. IPv6 Addressing

- IPv6 structure and notation
- Address types (link-local, global)
- Configuration and testing
- Packet Tracer practice: IPv6 addressing on LANs

13. ICMP

- Ping and traceroute
- Echo requests and replies
- Troubleshooting using ICMP
- Packet Tracer practice: Connectivity testing with ICMP

14. Transport Layer

- TCP vs UDP

- Ports and reliability
- Segmenting data
- Packet Tracer practice: Simulating TCP/UDP traffic

15. Application Layer

- HTTP, FTP, DNS, DHCP overview
- Client-server model
- Packet Tracer practice: Simulating web and file transfer protocols

16. Network Security Fundamentals

- Threats and vulnerabilities
- Basic mitigation techniques
- Firewall and ACL concepts
- Packet Tracer practice: Exploring ACL basics

17. Build a Small Network

- Topology design
- Device selection and IP planning
- Initial implementation
- Packet Tracer practice: Creating a small business network

18. WLAN Configuration

- Wireless standards
- Configuring wireless routers
- Encryption types (WPA, WPA2)
- Packet Tracer practice: WLAN setup and testing

19. Network Troubleshooting

- Common network issues
- Troubleshooting steps
- Tools and commands

- Packet Tracer practice: Diagnosing and resolving issues

20. Static Routing

- Route definition
- Next-hop and exit interfaces
- Routing tables
- Packet Tracer practice: Static routing configuration

21. Dynamic Routing (OSPF Intro)

- OSPF overview
- Single-area implementation
- Neighbor relationships
- Packet Tracer practice: OSPF basic setup

22. VLANs and Trunking

- VLAN creation
- Inter-VLAN routing
- Trunk ports and tagging
- Packet Tracer practice: VLAN configuration with trunk links

23. NAT and DHCP

- NAT types and translation
- DHCP setup and scopes
- Port Address Translation (PAT)
- Packet Tracer practice: NAT and DHCP implementation

The college reserves the right to make changes to the curriculum, course duration, teaching staff, and other related aspects at its sole discretion. Any information provided in the college's informational materials shall not be considered binding or constitute any form of commitment by the college.

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