NS3EDU – IT Networking Curriculum

CCNA & CCNP Level | Industry-Oriented | Job-Focused

LEVEL 1: CCNA – Networking Foundation (Beginner to Intermediate)

Part 1: Networking Fundamentals

- Introduction to Networking - Types of Networks (LAN, WAN, MAN, PAN) - Network Topologies - Client–Server vs Peer-to-Peer - Network Components & Roles - Bandwidth, Latency & Throughput - IEEE Networking Standards

Part 2: OSI & TCP/IP Models

- OSI Model (7 Layers – Detailed) - TCP/IP Model - Layer-wise Protocols - Encapsulation & De-encapsulation - Port Numbers & Services

Part 3: Physical Layer & Media

- UTP, STP & Fiber Optic Cables - Cable Categories (Cat5, Cat6, Cat6a) - Straight & Crossover Cables - Transmission Modes - NIC & Physical Connectivity

Part 4: Ethernet & Switching

- Ethernet Standards - MAC Addressing - Switch Working - CAM Table - Collision vs Broadcast Domains - Hub vs Switch vs Router

Part 5: IP Addressing

- IPv4 Structure - IP Address Classes - Public vs Private IP - Static vs Dynamic IP - Binary Conversion - Network ID & Host ID

Part 6: Subnetting & CIDR

-Subnetting Concepts - Subnet Mask - CIDR Notation - Hosts & Network Calculation - VLSM - Supernetting - Real-World Subnetting Scenarios

Part 7: Routing Basics

- Routing Concepts - Routing Table - Static Routing - Default Routing - Introduction to Dynamic Routing

Part 8: VLAN & Inter-VLAN Routing

- VLAN Concepts & Benefits - VLAN Types - Access & Trunk Ports - 802.1Q Tagging - Inter-VLAN Routing

Part 9: Network Services

- DHCP (DORA Process) - DNS (Records & Resolution) - NAT (Static, Dynamic, PAT)

Part 10: Network Security Fundamentals

- CIA Triad - Firewall Basics - Standard & Extended ACL - VPN Introduction - Common Network Attacks

Part 11: Wireless Networking

- Wi-Fi Standards (802.11 a/b/g/n/ac/ax) - Wireless Security (WPA2, WPA3) - Access Points - Wireless Troubleshooting

Part 12: WAN Technologies

- WAN Concepts - Leased Line - PPP - MPLS (Introduction) - SD-WAN Overview

Part 13: Monitoring & Troubleshooting

- Troubleshooting Methodology - Networking Commands - Packet Analysis Basics - Network Issue Scenarios

Outcome (CCNA Level): Learners gain strong networking fundamentals, can configure

LAN/WAN, perform
subnetting, and are CCNA exam & job ready.

LEVEL 2: CCNP – Advanced & Enterprise Networking

Part 14: Advanced Routing Protocols

- OSPF (Single & Multi Area) - EIGRP Concepts - BGP Fundamentals - Route Redistribution

Part 15: Advanced Switching

- STP & RSTP - EtherChannel - Advanced VLAN Design - High Availability Concepts

Part 16: Enterprise Network Design

- Hierarchical Network Model - Campus Network Design - Redundancy & Failover - Load Balancing

Part 17: Network Security (Advanced)

- Advanced ACL - Firewall Architectures - IDS & IPS - Network Hardening

Part 18: Automation & Modern Networking

- Network Automation Basics - SDN Concepts

- Introduction to Python for Networking - Cloud Networking Overview

Part 19: Real-World Labs & Projects

- Enterprise Network Design - Routing & VLAN Labs - Troubleshooting Scenarios - Real-Time Network Simulations

Part 20: Career & Certification Preparation

- CCNP Certification Overview - Network Engineer Roles - Interview Preparation - Resume & Lab Project Guidance

Tools & Technologies Covered

- Cisco Packet Tracer - GNS3 - Wireshark - Putty - Real Cisco Devices