CCNA (200-301) Cisco Certified Network Associate (40 hours)

Module 1: Network Fundamentals

- What is Networking? Types of Networks (LAN, WAN, MAN)

- OSI & TCP/IP Model

- IPv4 and IPv6 Addressing

  - Subnetting & VLSM

  - IPv4/IPv6 Address Types (Unicast, Multicast, etc.)

- MAC Address, ARP, DNS, DHCP

- Basic CLI Commands & Packet Tracer Introduction

Module 2: Network Access

- Ethernet (802.3), CSMA/CD

- Cabling (Straight, Cross, Console)

- Ethernet Frame Format

- Switch Fundamentals

- VLANs and Trunking (802.1Q)

- Inter-VLAN Routing

- Spanning Tree Protocol (STP, RSTP)

Module 3: IP Connectivity

- Router Basics & CLI Access

- Static Routing (RIP Optional)

- Default Routing

- Dynamic Routing Protocols Overview

  - OSPFv2 (Single Area) – Metric, Cost, Neighbor Relationships

- Routing Table Interpretation

- Route Summarization

Module 4: IP Services

- DHCP (Server and Relay)

- NAT & PAT (Static/Dynamic NAT)

- DNS Concepts

- NTP (Network Time Protocol)

- SNMP (Monitoring Basics)

- Syslog & Log Levels

Module 5: Security Fundamentals

- CIA Triad (Confidentiality, Integrity, Availability)

- Password Policies and Encryption

- Secure Device Access (SSH, Console)

- ACLs (Standard and Extended)

- Port Security on Switches

- DHCP Snooping

- DDoS Basics and Mitigation Concepts

Module 6: Automation and Programmability

- Controller-based Networking

- SDN Basics (Southbound/Northbound APIs)

- Python, JSON, REST API Basics (very basic syntax level)

- CLI vs GUI vs API management

- Configuration Management Tools Intro (Ansible optional)