

# ***Academy of Information Technology (AIT)***

**CISCO CERTIFIED**

**NETWORK ASSOCIATE (CCNA)**

**200-301 v1.1**

**Duration: 3 months**

## **CHAPTER 1**

### **Network Fundamentals**

- Network Components
- Layer 2 and Layer 3 Switches
- Routers
- Servers
- Endpoint Devices and Wireless Access Points

### **Network Topology Architecture**

- 2-Tier Topology
- 3-Tier Topology
- Spine-Leaf
- SOHO
- WAN
- Data On-Premises and Cloud

### **OSI Model**

- Study of all seven layers
- Compare TCP and UDP

## **CHAPTER 2**

### **IPv4 Addressing**

- Understand need of IPv4 Addressing
- Different Classes in IPv4
- Reserved IP Addresses
- Private IP Addresses
- Configure and Verify IPv4 Addressing on Packet Tracer
- Subnetting Basics
- CIDR Concept
- Calculate Class C, Class B and Class A Subnetting

## **CHAPTER 3**

### **IPv6 Addressing**

- Understand need of IPv6 Addressing
- Components of IPv6 Address Format

- Addressing Methods
- Unicast Address
- Multicast Address
- Anycast Address
- Global Unicast
- Unique Local
- Link-local
- Configure and Verify IPv6 Addressing on Packet Tracer

## **CHAPTER 4**

### **LAN Switching**

- Standard and Managed Switches
- Switch IOS
- Switch Booting Process
- Physical Ports on Layer 2 Switch and Layer 3 Switch
- Connecting Switch to PC or Laptop
- Basic Switch Commands
- Security using – Console Password, Privilege Mode
- SSH Security on Switch
- Understand Switching Concepts
- MAC Address Learning and Aging
- Frame Switching Methods
- Frame Flooding
- Creating network using Cisco Switch
- MAC Address Table

## **CHAPTER 5**

### **Network Access**

- Advantage of VLAN
- Create VLAN
- Access Ports
- Trunk Ports
- VOIP Access Ports
- Default VLAN
- Types of VLAN Ports
- VLAN Tagging – 802.1Q and ISL

- InterVLAN using Router
- InterVLAN using Layer-3 Switch
- VLANs Multiple Switches

## **CHAPTER 6**

### **Spanning Tree Protocol (STP)**

- Understand need for Rapid PVST+ Spanning Tree Protocol
- Configure RSTP On Switch
- STP Basic Operations
- BID, BPDU
- Root Bridge
- Root Port
- Port States – Forwarding/ Blocking
- PortFast Benefits

## **CHAPTER 7**

### **IP Connectivity using Routing**

- What is a Routing
- How Routing Table is Created
- Static Routing vs Dynamic Routing
- Concept of Administrative Distance
- Routing Protocol Metrics

### **Static Routing**

- Default Route
- Network Route
- Floating Static Routes
- Static Routing in IPv4 and IPv6 Networks

## **CHAPTER 8**

### **Dynamic Routing with RIPv1 and v2**

- Basics of Routing Info Protocol (RIPv1,v2)
- What is a Metric value
- Configuration Commands for RIP
- Configure Dynamic Routing on given example

### **Open Shortest Path First (OSPFv2)**

- Area ID Concept
- What is Router ID
- Backbone Router, Internal Router, Area Border Router
- Area Summary Border Router (ASBR)
- Configure OSPFv2 on IPv4 network

## **CHAPTER 9**

### **CDP and LLDP**

- Working of Cisco Discovery Protocol (CDP)
- Working of Link Layer Discovery Protocol (LLDP)
- Configuring CDP and LLDP for inventory

## **CHAPTER 10**

### **IP Services -Network Time Protocol (NTP)**

- What is Network Time Protocol
- Configure NTP in Client and Server Mode

### **Dynamic Host Configuration Protocol (DHCP)**

- Working of DHCP
- Configure DHCP on the Router to assign IP addresses automatically

### **Domain Name System (DNS)**

- Fundamentals of DNS in network
- Working of DNS
- Configure DNS on Router
- Verify DNS configuration

## **CHAPTER 11**

### **Simple Network Management Protocol (SNMP)**

- Functions of SNMP in the network
- SNMP Versions
- SNMP Messages
- SNMP Configuration in the network

### **Syslog Server**

- Functions of Syslog
- Levels of Log Messages
- Configure Syslog to collect Log messages centrally

## **CHAPTER 12**

### **Security Fundamentals -Key Security concepts**

- Fundamentals of Network Security
- Components of Network Security
- Define key security concepts like Threats, vulnerabilities, exploits and mitigation.

### **Access Control List (ACL)**

- Security Fundamentals
- Types of ACL
- Standard, Extended and Named ACL
- ACL Configuration

## **CHAPTER 13**

### **Network Address Translation (NAT)**

- NAT Terminology
- NAT Types
- Static NAT
- Dynamic NAT
- PAT-Overloading

## **CHAPTER 14**

### **FHRP-First Hop Redundancy Protocol**

- Configure FHRP on Router

### **QoS- Quality of Service**

- Configure QoS on Router

## **CHAPTER 15**

- Introduction to Wireless Networks

- Wireless Organizations
- SOHO Wireless LAN
- Enterprise Wireless LAN
- Wireless LAN 802.11 Service Sets
- AP Modes
- Wireless Architecture
- WLAN Security Standards
- Wired Equivalent Privacy (WEP)
- Wi-Fi Protected Access (WPA)
- Wi-Fi Protected Access 2 (WPA2)

## **CHAPTER 16**

### **Advanced CCNA Topics**

- DHCP Snooping
- Remote Access and Site to Site VPN
- Automation and Programmability
- Explain AI (generative and predictive) and machine learning in network operations
- Describe characteristics of REST-based APIs (authentication types, CRUD, HTTP verbs, and data encoding)
- Recognize the capabilities of configuration management mechanisms such as Ansible and Terraform
- Recognize components of JSON-encoded data

## **FINAL EXAM**