Cisco Certified Network Associate (CCNA)

Goal: To enhance the ability to install, operate and troubleshoot a medium-sized enterprise branch network, including basic network security. The course covers introduction of CCNA/CCNP certification, networking fundamentals, switching and routing fundamentals, and configuring simple networks.

1. **Introduction**
   - 1.1. Introduction of Computer/Cisco networking
   - 1.2. Introduction of CCENT/CCNA/CCNP/CCIE
   - 1.3. Cisco certification

2. **Network Fundamentals**
   - 2.1. Compare and contrast OSI and TCP/IP models
   - 2.2. Compare and contrast network topologies
   - 2.3. Configure, verify and troubleshoot IPv4 address and Subnetting
   - 2.4. Describe the need for private IPv4 addressing
   - 2.5. Configure and verify IPv6 addressing

3. **LAN switching technologies**
   - 3.1. Describe and verify switching concepts
     - 3.1.1. MAC learning
     - 3.1.2. Frame switching
     - 3.1.3. Frame flooding
     - 3.1.4. MAC address table
   - 3.2. Configure, verify and troubleshoot VLANs
     - 3.2.1. Access ports (data and voice)
     - 3.2.2. Default VLAN
   - 3.3. Configure, verify and troubleshoot interswitch connectivity
     - 3.3.1. Trunk ports
     - 3.3.2. Add and remove VLANs on a trunk
     - 3.3.3. Native VLAN
   - 3.4. Troubleshoot Interface and cable issues (collisions, errors, duplex, and speed)

4. **Routing Technologies**
   - 4.1. Describe the routing concepts
     - 4.1.1. Router and routing protocols
     - 4.1.2. Packet handling along the path through a network
     - 4.1.3. Forwarding decision based on route lookup

- 4.2. Interpret the components of a routing table
  - 4.2.1. Prefix
  - 4.2.2. Network Mask
  - 4.2.3. Next Hop
  - 4.2.4. Routing protocol code
  - 4.2.5. Administrative distance
  - 4.2.6. Metric
  - 4.2.7. Gateway of last resort
- 4.3. Compare and contract static routing and dynamic routing
- 4.4. Compare and contract distance vector and link state routing protocols
- 4.5. Compare and contract interior and exterior routing protocols
- 4.6. Configure, verify and troubleshoot static routing
- 4.7. Configure, verify and troubleshoot RIPv1 and RIPv2 routing
- 4.8. Configure, verify and troubleshoot OSPFv2 routing
- 4.9. Configure, verify and troubleshoot EIGRP routing

5. Infrastructure Services

- 5.1. Describe DNS lookup operation
- 5.2. Troubleshoot client connectivity issues involving DNS
- 5.3. Configure and verify DHCP on a router
  - 5.3.1. Server
  - 5.3.2. Relay
  - 5.3.3. Client
- 5.4. Configure, verify and troubleshoot inside source NAT
  - 5.4.1. Static
  - 5.4.2. Pool
  - 5.4.3. PAT
- 5.5. Configure and verify NTP operating in a client/server mode