



# Canada College

## Collège Canada

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### CCNA Program

#### CCNA1 Day 1, 2, 3, and 4

##### Course Description

CCNA 1: Networking Basics is the first of the four courses leading to the Cisco Certified Network Associate (CCNA) designation.

CCNA 1 introduces Cisco Networking Academy Program students to the networking field.

The course focuses on network terminology and protocols, local-area networks (LANs), wide-area networks (WANs), Open System Interconnection (OSI) models, cabling, cabling tools, routers, router programming, Ethernet, Internet Protocol (IP) addressing, and network standards.

In addition, instruction and training are provided in the proper care, maintenance, and use of networking software, tools, and equipment and all local, state, and federal safety, building, and environmental codes and regulations.

##### Course Objectives

Upon completion of this course, students will be able to perform tasks related to:

- Networking Mathematics, Terminology, and Models
- Networking Media: copper, optical, and wireless
- Cable testing and cabling LANs and WANs
- Ethernet Operation and 10/100/1000/10 G versions of Ethernet
- Ethernet Switching
- IP Addressing, Subnetting
- TCP/IP Protocols: IP, TCP and UDP, Application Layer Protocols

#### CCNA2 Day 5, 6, 7, and 8

##### Course Description

CCNA 2: Routers and Routing Basics is the second of four CCNA courses leading to the Cisco Certified Network Associate (CCNA) designation. CCNA 2 focuses on initial router configuration, Cisco IOS Software management, routing protocol configuration, TCP/IP, and access control lists (ACLs). Students will develop skills on how to configure a router, managing Cisco IOS Software, configuring routing protocol on routers, and set the access lists to control the access to routers.

##### Course Objectives

Upon completion of this course, students will be able to perform tasks related to:

- Routers and their role in WANs
- Cisco IOS
- Router Configuration
- Router File Management
- RIP and IGRP Routing Protocols
- TCP/IP Error and Control Messages
- Router Troubleshooting
- Intermediate TCP
- Access Control Lists

### CCNA3 Day 9, 10, 11, and 12

#### Course Description

CCNA3: Switching Basics and Intermediate Routing is the third of four courses leading to the Cisco Certified Network Associate (CCNA) designation. The course focuses on advanced IP addressing techniques (Variable Length Subnet Masking [VLSM]), intermediate routing protocols (RIP v2, single-area OSPF, EIGRP), command-line interface configuration of switches, Ethernet switching, Virtual LANs (VLANs), Spanning Tree Protocol (STP), and VLAN Trunking Protocol (VTP). Particular emphasis is given to students being able to demonstrate the ability to apply learnings from CCNA 1 and 2 to a network and to be able to explain how and why a particular strategy is employed.

#### Course Objectives

Upon completion of this course, students will be able to perform tasks related to:

Variable Length Subnet Masking (VLSM)

Intermediate routing protocols (RIP v2, single-area OSPF, EIGRP)

Switching Concepts

Switches

Switch Configuration

Spanning Tree Protocol (STP)

Virtual LANs (VLANs)

VLAN Trunking Protocol (VTP)

### CCNA4 Day 13, 14, 15 and 16

#### Course Description

CCNA 4: WAN Technologies is the last of four courses leading to the Cisco Certified Network Associate (CCNA) designation. The course focuses on advanced IP addressing techniques (Network Address Translation [NAT], Port Address Translation [PAT], and DHCP), WAN technology and terminology, PPP, ISDN, DDR, Frame Relay, network management, and introduction to optical networking. Particular emphasis is given to students being able to demonstrate the ability to apply knowledge from CCNA 1, CCNA 2, and CCNA 3 to a network and to be able to explain how and why a particular strategy is employed. In addition, the student will prepare for taking the CCNA Exam.

#### Course Objectives

Upon completion of this course, students will be able to perform tasks related to:

Network Address Translation (NAT) and Port Address Translation (PAT)

Dynamic Host Configuration Protocol (DHCP)

WAN Technologies

Point-to-Point Protocol (PPP)

Integrated Services Digital Network (ISDN)

Dial-on-Demand Routing (DDR)

Frame Relay

Network Management

Optical Networking

**Duration:** 16 Days = 80hours, 3-4times a week/4 hours a day/evening/5 weeks

**Registration fee:** \$30.00

**Tuition fee:** \$720.00

#### Course Description

The CCNA exam is the qualifying exam available to candidates pursuing a single-exam option for the Cisco Certified Network Associate CCNA certification. The exam will certify that the successful candidate has important knowledge and skills necessary to select, connect, configure, and troubleshoot the various Cisco networking devices. The exam covers topics on Extending Switched Networks with VLANS, Determining IP Routes, Managing IP traffic with Access Lists, Establishing Point-to-Point connections, and Establishing Frame Relay Connections.

This course will be a combination of lectures and hands-on labs utilizing software simulators allowing students to simulate the management of a multiple router/switch environment utilizing Cisco's Internetwork Operating System (IOS). It is assumed students already have CompTIA Network+ Certification or equivalent knowledge.

### **Exam Topics:**

The following topics are general guidelines for the content likely to be included on CCNA exams. However, other related topics may also appear on any specific delivery of the exam.

### **Planning & Designing**

- Design a simple LAN using Cisco Technology
- Design an IP addressing scheme to meet design requirements with VLMS
- Select an appropriate routing protocol based on user requirements
- Design a simple internet work using Cisco technology
- Develop an access list to meet user specifications
- Choose WAN services to meet customer requirements

### **Implementation & Operation**

- Configure routing protocols given user requirements
  - RIP, OSPF, IGRP, EIGRP
- Configure IP addresses, subnet masks, and gateway addresses on routers and hosts
- Configure a router for additional administrative functionality
- Configure a switch with VLANS and inter-switch communication
- Implement a LAN
- Customize a switch configuration to meet specified network requirements
- Manage system image and device configuration files
- Perform an initial configuration on a router
- Perform an initial configuration on a switch
- Implement access lists
- Implement simple WAN protocols
- Establish communication between a terminal device and the router IOS, and use IOS for system analysis
- Use commands incorporated within IOS to analyze and report network problems
- Describe and install the hardware and software required to be able to communicate via a network
- Use embedded data link layer functionality to perform network neighbor discovery and analysis from the router
- Use embedded layer 3 through layer 7 protocols to establish, test, suspend or disconnect connectivity to remote devices from the router console

### **Troubleshooting**

- Utilize the OSI model as a guide for systematic network troubleshooting
- Perform LAN and VLAN troubleshooting
- Troubleshoot routing protocols
- Troubleshoot IP addressing and host configuration
- Troubleshoot a device as part of a working network
- Troubleshoot an access list
- Perform simple WAN troubleshooting

### **Technology**

- Describe network communications using layered models

Describe the Spanning Tree process  
Compare and contrast key characteristics of LAN environments  
Evaluate the characteristics of routing protocols  
Evaluate TCP/IP communication process and its associated protocols  
Describe the components of network devices

Evaluate rules for packet control

Evaluate key characteristics of WANs  
Demonstrate the mathematical skills required to work seamlessly with integer decimal, binary and hexadecimal numbers and simple binary logic  
Define and describe the structure and technologies of computer networks  
Identify the key characteristics of common wide area networking (WAN) configurations and technologies, and differentiate between these and common LAN technologies  
Describe the purpose and fundamental operation of the internet work operating system (IOS)  
Describe the role of a router in a WAN  
Describe how an IP address is associated with a device interface, and the association between physical and employ IP addressing techniques  
Explain how collisions are detected and handled in an Ethernet system  
Explain the fundamental concepts associated with the Ethernet media access technique  
Describe the operation of the Internet Control Message Protocol (ICMP) and identify the reasons, types and format of associated error and control messages  
Employ IP addressing techniques

**Prerequisites:**

Prerequisites for the Program: [CompTIA Network+ Certification](#) or equivalent experience.

It is very important that individuals taking this course have a good working knowledge of the subject matter covered in the CompTIA Network+ Certification exam. This subject matter includes such subjects as:

The TCP/IP protocol suite basics  
OSI Model functionality  
The concept of logical addresses versus physical addresses  
The differences between a bridge, switch and a router

**Note:**

In order to qualify your level of knowledge, a basic competency exam on the OSI model is available in the CBT office.

**CCNA Certification Options**

*Candidates have two options to obtain their CCNA certification:*

1. Passing the CCNA 640-801 exam
- or**
2. Passing the INTRO 640-821 exam and the ICND 640-811 exam

**CCNA Virtual Lab Simulator software**

Students will complete labs using a RouterSIM Virtual Lab simulation software package to practice and complete extensive hands-on labs with Cisco's IOS. Students configure routers and switches to utilize TCP/IP, VLANs, Access Lists, Routing Protocols, Static Routes, Frame Relay, Sub interfaces, and much more.

Students will receive a copy of a Sybex simulator in their books which supports the basic command sets needed to pass the exams. *This is not the same software as used in the classroom, but will allow students to practice at home.*

For more information on the CISCO Certifications, visit [Cisco's Certification Website](#)

### **CCNA Course Content**

CCNA presents important networking fundamentals using the Open Systems Interconnect (OSI) seven layer model concepts; terminology and technologies are explained and illustrated using text and graphics animation.

#### **After completing this course, students will be able to:**

- Describe computer hardware basics, binary and hexadecimal number systems, basic networking terminology, and internetworking concepts
- Identify the major components of a network system, including clients and servers, network interface cards (NICs), internetworking devices, media, and topologies
- Describe the functions, operations, and primary components of local-area networks (LANs), wide-area networks (WANs), metropolitan-area networks (MANs), storage-area networks (SANs), content networks (CNs), and virtual private networks (VPNs)
- Describe the major network access methods and outline the key features of each
- Describe the functions and operations of switching technologies
- Explain the format and significance of each of the following components to a network system: IP addressing, classes, reserved address space, and subnetting
- Calculate valid subnetwork addresses and mask values so that user/network requirements are met when given an IP address scheme
- Explain the purposes of networking addresses, routing protocols, and routed protocols
- Describe the functions, operations, and primary components of WAN technologies
- Describe the function, operation, and primary components required to provide remote access services
- Use available configuration tools to establish connectivity to the appropriate network device in order to complete the initial device configuration

### **CCNA Course Outline**

- Introduction to Networking
- Network Types
- Network Media
- Switching Fundamentals
- TCP/ IP
- IP Addressing and Routing
- WAN Technologies
- Operating and Configuring Cisco IOS Devices
- Managing your Network Environment