CCNA Routing and Switching

The Cisco Networking Academy® CCNA Routing and Switching curriculum is designed for students who are seeking entry-level ICT jobs or plan to pursue more specialized ICT skills.

CCNA Routing and Switching provides comprehensive coverage of networking topics, from fundamentals to advanced applications and services, with opportunities for hands-on practical experience and career skills development.

Cisco Certifications

Students will be prepared to take the Cisco CCENT® certification exam after completing a set of two courses and the CCNA® Routing and Switching certification exam after completing a set of four courses.

Features and Benefits

The CCNA Routing and Switching curriculum offers the following features and benefits:

- Students learn the basics of routing, switching, and advanced technologies to prepare for the CCENT and CCNA certification exams, networking related degree programs, and entry-level careers.
- The language used to describe networking concepts is designed to be easily understood by learners at all levels and embedded interactive activities help reinforce comprehension.
- Courses emphasize critical thinking, problem solving, collaboration, and the practical application of skills.
- Multimedia learning tools, including videos, games, and quizzes, address a variety of learning styles and promote increased knowledge retention.
- Hands-on labs and Cisco® Packet Tracer simulation-based learning activities help students develop critical thinking and complex problem solving skills.
- Embedded assessments provide immediate feedback to support the evaluation of knowledge and acquired skills.

Course Description

CCNA Routing and Switching teaches comprehensive networking concepts, from network applications to the protocols and services provided to those applications by the lower layers of the network. Students will progress from basic networking to more complex enterprise and theoretical networking models later in the curriculum.

There are four courses in the recommended sequence:

- Introduction to Networks
- Routing and Switching Essentials
- Scaling Networks
- Connecting Networks

In each course, Networking Academy™ students will learn technology concepts with the support of interactive media and apply and practice this knowledge through a series of hands-on and simulated activities that reinforce their learning.

Course	Description
Introduction to Networks	Introduces the architecture, structure, functions, components, and models of the Internet and computer networks. The principles of IP addressing and fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes.
Routing and Switching Essentials	Describes the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPv2, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks.
Scaling Networks	Describes the architecture, components, and operations of routers and switches in a large and complex network. Students learn how to configure routers and switches for advanced functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP, STP, and VTP in both IPv4 and IPv6 networks. Students will also develop the knowledge and skills needed to implement DHCP and DNS operations in a network.
Connecting Networks	Discusses the WAN technologies and network services required by converged applications in a complex network. The course enables students to understand the selection criteria of network devices and WAN technologies to meet network requirements. Students learn how to configure and troubleshoot network devices and resolve common issues with data link protocols. Students also develop the knowledge and skills needed to implement IPSec and virtual private network (VPN) operations in a complex network

Skills and Competencies

Here are some examples of tasks students will be able to perform after completing each course.

Introduction to Networks	Routing and Switching Essentials
Describe the devices and services used to support communications in data networks and the Internet	Describe enhanced switching technologies such as VLANs, VLAN Trunking Protocol, Rapid Spanning Tree Protocol, and 802.1q
Describe the role of protocol layers in data networks	Describe basic switching concepts and the operation of Cisco switches
Describe the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments	Configure and troubleshoot basic operations of a small switched network
Design, calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 network	Configure and troubleshoot basic operations of routers in a small routed network
Build a simple Ethernet network using routers and switches	Configure and troubleshoot VLANs and inter-VLAN routing
Use Cisco command-line interface (CLI) commands to perform basic router and switch configurations	Describe the operations of Dynamic Host Configuration Protocol and Domain Name System for IPv4 and IPv6

Scaling Networks	Connecting Networks
Configure and troubleshoot DHCP and DNS operations for IPv4 and IPv6	Describe the operations and benefits of virtual private networks (VPNs) and tunneling
Describe the operations and benefits of the Spanning Tree Protocol (STP)	describe different WAN technologies and their benefits
Configure and troubleshoot STP operations	Configure and troubleshoot serial connections
Describe the operations and benefits of link aggregation and Cisco VLAN Trunk Protocol (VTP)	Configure and troubleshoot broadband connections
Configure and troubleshoot basic operations of routers in a complex routed network for IPv4 and IPv6	Configure and troubleshoot IPSec tunneling operations
Configure and troubleshoot advanced operations of routers and implement RIP, OSPF, and EIGRP routing protocols for IPv4 and IPv6	Monitor and troubleshoot network operations using syslog, SNMP, and NetFlow
Manage Cisco IOS® Software licensing and configuration files	Design network architectures for borderless networks, data centers, and collaboration

About Cisco Networking Academy

In partnership with schools and organizations around the world, Cisco Networking Academy delivers a comprehensive learning experience to help students develop ICT skills for career opportunities, continuing education, and globally recognized career certifications.

To learn more, visit: **www.netacad.com**.