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:

1. Introduction to Networks
2. Scaling Networks
3. Routing and Switching Essentials
4. 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.
Skills and Competencies

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

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

- Configure and troubleshoot DHCP and DNS operations for IPv4 and IPv6
- Describe the operations and benefits of the Spanning Tree Protocol (STP)
- Configure and troubleshoot STP operations
- Describe the operations and benefits of link aggregation and Cisco VLAN Trunk Protocol (VTP)
- Configure and troubleshoot basic operations of routers in a complex routed network for IPv4 and IPv6
- Configure and troubleshoot advanced operations of routers and implement RIP, OSPF, and EIGRP routing protocols for IPv4 and IPv6
- Manage Cisco IOS® Software licensing and configuration files
- 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

### Connecting Networks

- Describe the operations and benefits of virtual private networks (VPNs) and tunneling
- Describe different WAN technologies and their benefits
- Configure and troubleshoot serial connections
- Configure and troubleshoot broadband connections
- Configure and troubleshoot STP operations
- Configure and troubleshoot serial connections
- Configure and troubleshoot STP operations
- Configure and troubleshoot serial connections
- 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](http://www.netacad.com).