

The Networking Academy Learning Portfolio

- Aligns to Certification
- Instructor Training required
- Self-paced

* Available within 12 months

		Collaborate for Impact				
		Introduction to Packet Tracer	Packet Tracer	Hackathons	Prototyping Lab	Internships
		Foundational			Career-Ready	
	Exploratory					
Networking		<ul style="list-style-type: none"> Networking Essentials Mobility Fundamentals Emerging Tech Workshop: Network Programmability Using Cisco APIC-EM 			<ul style="list-style-type: none"> CCNA R&S: Introduction to Networks R&S Essentials, Scaling Networks, Connecting Networks CCNP R&S: Switch, Route, Tshoot 	
Security	Introduction to Cybersecurity	Cybersecurity Essentials			<ul style="list-style-type: none"> CCNA Security CCNA Cybersecurity Operations 	
IoT & Analytics	Introduction to IoT	<ul style="list-style-type: none"> IoT Fundamentals: Connecting Things, Big Data & Analytics, IoT Security Hackathon Playbook 				
OS & IT	NDG Linux Unhatched	<ul style="list-style-type: none"> NDG Linux Essentials IT Essentials 			<ul style="list-style-type: none"> NDG Linux I NDG Linux II 	
Programming		<ul style="list-style-type: none"> CLA: Programming Essentials in C CPA: Programming Essentials in C++ PCAP: Programming Essentials in Python Emerging Tech Workshop: Experimenting with REST APIs using WebEx Teams 			<ul style="list-style-type: none"> CLP: Advanced Programming in C CPP: Advanced Programming in C++ 	
Business	Be Your Own Boss	Entrepreneurship				
Digital Literacy	Get Connected					

Networking Essentials

Course Overview

Networking Essentials teaches networking based on application, covering networking concepts within the context of network environments students may encounter in their daily lives – from small office and home office (SOHO) networking. Students who complete this course are prepared to begin the CCNA Routing & Switching and IoT curricula.

Benefits

Students will recognize the significant impact of networking in the world and learn skills needed for entry-level home and small business network installation positions. Will also begin to develop skills needed to become network technicians, cable installers, and help desk technicians. This course also serves as a foundation for CCNA ITN course.

Learning Components

- 9 chapters
- hands-on labs
- Cisco Packet Tracer files
- hands on skill assessment
- chapter exams, checkpoint exam, practice final exam, final exam

➔ <https://www.netacad.com/group/resources/networking-essentials>



Portfolio Positioning: Foundational

Target Audience: High schools, secondary schools, career and technical schools, community organizations. College and university students studying other non-IT fields

Prerequisites: None

Languages: English, French, Portuguese, Russian, Simplified Chinese, Spanish. Arabic version will be released soon.

Course Delivery: Instructor led

Estimated Time to Complete: 70 hours

Recommended Next Course: CCNA R&S Introduction to Networks, IT Essentials, I2IoT

CCNA R&S: Introduction to Networks

Course Overview

The first course in the Cisco CCNA Routing and Switching curriculum teaches students about the architecture, structure, functions and components of the Internet and other computer networks.

Students achieve a basic understanding of how networks operate.

Benefits

By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP

Learning Components

- 11 chapters
- 36 hands-on labs and 1 hands-on skills assessment
- Pre-test, 11 chapter quizzes, 1 sectional
- quizzes, 11 chapter exams, and 1 final exam
- 2 Cisco Packet Tracer skills-based assessments



Certification
Aligned

Features

Target Audience: Secondary vocational students, 2-year and 4-year college students in Networking or Engineering programs

Prerequisites: None

Instructor Training Required: Yes

Languages: Arabic, Chinese-S, Chinese-T, Croatian, English, French, Georgian, German, Hebrew, Hungarian, Italian, Japanese, Polish, Portuguese, Romanian, Russian, Spanish, Turkish

Course Delivery: Instructor-led

Estimated Time to Complete: 70 hours

Recommended Next Course: CCNA R&S Routing and Switching Essentials

Zielgruppen

Networking Essentials

The Cisco® Networking Essentials curriculum is designed for high school, college, and Cisco Networking Academy® students that are interested in completing an introductory networking course.

For proper skill building, the students should have a basic understanding of how to use a computer and browse the Internet.

CCNA ITN

The Cisco CCNA® Routing and Switching curriculum is designed for Cisco Networking Academy® students who are seeking entry-level jobs in the ICT industry or hope to fulfill prerequisites to pursue more specialized ICT skills. CCNA Routing and Switching provides an integrated and comprehensive coverage of networking topics, from fundamentals to advanced applications and services, while providing opportunities for hands-on practical experience and career skills development.

The curriculum is appropriate for students at many education levels and types of institutions, including high schools, secondary schools, universities, colleges, career and technical schools, and community centers.

Lernziele – Networking Essentials

The goal of this course is to introduce the student to networking, network service and device configuration, and Cisco routers and switches. The online course materials will assist the student in communicating their knowledge and desire to learn more about networking and pursue a networking career.

Upon completion of the Networking Essentials course, students will be able to perform the following tasks:

- Explain how end-user devices and local networks interact with the global Internet.
- Explain the requirements for network connectivity.
- Build a small network using an integrated network router.
- Explain the importance of IP addressing.
- Explain how the protocols of the TCP/IP suite enable network communication.
- Configure an integrated wireless router and wireless clients to connect securely to the Internet.
- Configure basic network security.
- Build a simple computer network using Cisco devices.
- Troubleshoot common network issues found in home and small business networks.

Lernziele – ITN

This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP addressing and the 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.

Students who complete Introduction to Networks will be able to perform the following functions:

- Explain network technologies.
- Explain how devices access local and remote network resources.
- Implement basic network connectivity between devices.
- Design an IP addressing scheme to provide network connectivity for a small to medium-sized business network.
- Describe router hardware.
- Explain how switching operates in a small to medium-sized business network.
- Configure monitoring tools available for small to medium-sized business networks.
- Configure initial settings on a network device.

Course Outline - NE

Chapter	Goals/Objectives
Chapter 1. Ever Wonder How it Works?	<ul style="list-style-type: none">• Explain how end-user devices and local networks interact with the global Internet.• Explain the concept of network communication.• Explain the roles of devices in a network.• Build a functioning network.
Chapter 2. Networks in Our Daily Lives	<ul style="list-style-type: none">• Explain the requirements for network connectivity.• Explain the basic requirements for getting online.• Explain the importance of network representations.• Build an Ethernet cable.
Chapter 3. Communicating on a Local Network	<ul style="list-style-type: none">• Build a small network using an integrated network router.• Explain the importance of standards and protocols in network communications.• Explain how protocol model layers represent network functionality.• Explain how communication occurs on Ethernet networks.• Explain why routers and switches are important in a network.• Configure devices on a LAN.
Chapter 4. Network Addressing	<ul style="list-style-type: none">• Explain the importance of IP addressing.• Explain the features of an IP address.• Explain the features of the different types of IPv4 addresses.• Configure a DHCP server.• Explain the need for public and private addressing.• Explain the need for IPv6.
Chapter 5. Providing Network Services	<ul style="list-style-type: none">• Explain how the protocols of the TCP/IP suite enable network communication.• Explain how clients access Internet services.• Explain how the protocols of the transport layer support network communications.• Explain the function of common Internet client/server applications.

Course Outline - NE (cont)

Chapter	Goals/Objectives
Chapter 6. Building a Home Network	<ul style="list-style-type: none">• Configure an integrated wireless router and wireless clients to connect securely to the Internet.• Compare different types of network connections.• Explain how Wi-Fi functions.• Connect wireless PC clients to a wireless router.• Compare the options available for connecting to the ISP.• Configure a wireless LAN device to protect data and the network.• Explain how to configure mobile devices to use various wireless technologies.
Chapter 7. Network Security	<ul style="list-style-type: none">• Configure basic network security.• Explain network security threats.• Explain other types of network security threats.• Explain how software tools can mitigate network security threats.• Configure a firewall to control network traffic.
Chapter 8. Configuring Cisco Devices	<ul style="list-style-type: none">• Build a simple computer network using Cisco devices.• Explain the basic features of Cisco LAN switches.• Explain the features of a Cisco small business router.• Explain how to use the Cisco IOS.• Use common show commands to view device status.• Build a switch and router network.
Chapter 9. Testing and Troubleshooting	<ul style="list-style-type: none">• Troubleshoot common network issues found in home and small business networks.• Explain the steps to take when a new configuration does not work as expected.• Troubleshoot network problems with common network utilities.• Troubleshoot a network connectivity problem.• Explain how to work with customer support.

Course Outline - ITN

Chapter	Goals/Objectives
Chapter 1. Explore the Network	<ul style="list-style-type: none">• Explain how multiple networks are used in everyday life.• Explain how topologies and devices are connected in a small to medium-sized business network.• Explain the characteristics of a network that supports communication in a small to medium-sized business.• Explain trends in networking that will affect the use of networks in small to medium-sized businesses.
Chapter 2. Configure a Network Operating System	<ul style="list-style-type: none">• Explain the features and functions of the Cisco IOS Software.• Configure initial settings on a network device using the Cisco IOS Software.• Given an IP addressing scheme, configure IP address parameters on devices to provide end-to-end connectivity in a small to medium-sized business network.
Chapter 3. Network Protocols and Communications	<ul style="list-style-type: none">• Explain how rules facilitate communication.• Explain the role of protocols and standards organizations in facilitating interoperability in network communications• Explain how devices on a LAN access resources in a small to medium-sized business network.
Chapter 4. Network Access	<ul style="list-style-type: none">• Explain how physical layer protocols and services support communications across data networks.• Build a simple network using the appropriate media.• Explain the role of the data link layer in supporting communications across data networks.• Compare media access control techniques and logical topologies used in networks.
Chapter 5. Ethernet	<ul style="list-style-type: none">• Explain the operation of Ethernet.• Explain how a switch operates.• Explain how the address resolution protocol enables communication on a network.

Course Outline - ITN (cont)

Chapter	Goals/Objectives
Chapter 6. Network Layer	<ul style="list-style-type: none">• Explain how network layer protocols and services support communications across data networks.• Explain how routers enable end-to-end connectivity in a small to medium-sized business network• Explain how devices route traffic in a small to <u>mediumsized</u> business network.• Configure a router with basic configurations.
Chapter 7. IP Addressing	<ul style="list-style-type: none">• Explain the use of IPv4 addresses to provide connectivity in small to medium-sized networks.• Configure IPv6 addresses to provide connectivity in small to medium-sized business networks.• Use common testing utilities to verify and test network connectivity.
Chapter 8. <u>Subnetting</u> IP Networks	<ul style="list-style-type: none">• Implement an IPv4 addressing scheme to enable end-to-end connectivity in a small to medium-sized business network• Given a set of requirements, implement a VLSM addressing scheme to provide connectivity to end users in a small to medium-sized network.• Explain design considerations for implementing IPv6 in a business network.
Chapter 9. Transport Layer	<ul style="list-style-type: none">• Explain how transport layer protocols and services support communications across data networks.• Compare the operations of transport layer protocols in supporting end-to-end communication.
Chapter 10. Application Layer	<ul style="list-style-type: none">• Explain the operation of the application layer in providing support to end-user applications.• Explain how well-known TCP/IP application layer protocols operate.
Chapter 11. Build a Small Network	<ul style="list-style-type: none">• Explain how a small network of directly connected segments is created, configured and verified.• Configure switches and routers with device hardening features to enhance security.• Use common show commands and utilities to establish a relative performance baseline for the network.

Networking Essentials

Version 1.0 | Released October 2016 [Release Notes & Versions](#)

Course Overview

This course introduces a variety of topics to build students' skills and understanding of networking. The course also introduces networking devices and the Cisco IOS® software. Students will learn how networks are set up, how devices are configured, how communication takes place on a network and the basics of implementing network security best practices which will enhance the students' confidence in communicating their knowledge and work in networking-related professions. This course includes activities that expand on the course material presented. Upon completion of this course, the end-of-course survey, and the end-of-course assessment, the student will receive a Certificate of Completion.

[Read More](#)

Classroom Resources

[Instructor PPT](#)

[Scope & Sequence](#)

[Translated Instructor Resources](#)

Lab Resources

[Students Lab Source Files](#)

[Instructor Lab Source Files](#)

[Packet Tracer Activity Source Files](#)

[Student Packet Tracer Source Files](#)

[Instructor Packet Tracer Source Files](#)

[Capstone Project - Implement a Tech Solution for a Small Business](#)

Marketing Resources

[Release Note](#)

[FAQ](#)

[Curriculum Overview PPT](#)

Quick Links

[Accessibility Statement \(PDF\)](#)

[Scope and Sequence](#)

[FAQ](#)

[Translated Instructor Resources](#)

News

[Mac Users! A New Packet Tracer Releases](#)

April 10, 2019

[Webinar: Before, During, and After a Security Attack](#)

März 27, 2019

[New Release for Introduction Packet Tracer](#)

März 06, 2019

[Packet Tracer 7.2.1 Now Available](#)

Januar 02, 2019

[Errors in Assessment Scoring with Packet Tracer 7.2](#)

Oktober 25, 2018

[Bottom link](#)

CCNA R&S: Introduction to Networks

CCNA Routing & Switching Curriculum

Version 6.0 | Released November 2016 Release Notes & Versions

Course Overview

CCNA R&S: Introduction to Networks (ITN) covers networking architecture, structure, and functions. The course introduces the principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations to provide a foundation for the curriculum.

By the end of the course, students will be able to:

- Explain network technologies.
- Explain how devices access local and remote network resources.

[Read More](#)

Classroom Resources

[Instructor PPT](#)
[Syntax Checker](#)
[Icon Glossary](#)

[Translated Instructor Resources](#)

Curriculum Enhancements:

Hot topics you can add to increase engagement

[NEW Workshop!](#) [Network Programmability](#)
[Mobility Fundamentals](#)

Assessment Resources

[Skills Assessment](#)
[Exam Design Document](#)
[Packet Tracer Skills Assessment Design](#)

Lab Resources

[Student Lab Source Files](#)
[Student Packet Tracer Source Files](#)
[Instructor Lab Manual](#)
[Instructor Lab Source Files](#)
[Instructor Lab PDF Files](#)
[Instructor Packet Tracer Manual](#)
[Instructor Packet Tracer PDF Files](#)
[Instructor Packet Tracer Source Files](#)
[Packet Tracer Activity Source Files](#)

Marketing Resources

[Release Notes](#)
[Scope and Sequence](#)
[CCNA R&S FAQ](#)
[Curriculum Overview PPT](#)
[Curriculum At-A-Glance](#)
[6 Reasons To Go 6.0](#)

Quick links

[Accessibility Statement \(PDF\)](#)
[Best Practices Teaching CCNA R&S](#)
[CCNA R&S FAQ](#)
[Errata](#)
[General Assessment Resources](#)

[Packet Tracer Resources](#)
[Release Notes](#)
[Scope and Sequence](#)
[Translated Languages](#)
[Workshop: Network Programmability](#)

Latest News

[Mac Users! A New Packet Tracer Releases](#)
April 10, 2019

[Webinar: Before, During, and After a Security Attack](#)
März 27, 2019

[New Release for Introduction Packet Tracer](#)
März 06, 2019

[Special Exam Accommodations for Students with Disabilities](#)
Februar 13, 2019

[Packet Tracer 7.2.1 Now Available](#)
Januar 02, 2019

[go to news & events](#)

Equipment Requirement - NE

Lab Hardware Requirements

- 2 PCs running Windows 10
- 1 Wireless NIC or USB dongle
- 1 CISCO Integrated Services Router Generation 2 (ISR-G2)
- 1 WS-C2960-24TT-L Cisco Catalyst switch
- 1 Wireless Router
- A smartphone or tablet as a host device
- Assorted Ethernet cables
- RJ-45 connectors

- RJ-45 crimping tool
- Wire cutter
- Wire stripper
- Ethernet cable tester (optional)
- DB-9 to RJ-45 console cable with DB-9 to USB adapter if necessary
- Mini-USB to USB-A cable

Lab Software Requirements

- Tera Term

Equipment Requirement - ITE

Lab Hardware Requirements

- 2 PCs running Windows 10
- 3 CISCO Integrated Services Routers Generation 2 (ISR-G2)
- 3 HWIC-2T Serial WAN Interface Cards
- 3 WS-C2960-24TC-L Cisco Catalyst switches
- Assorted Ethernet and Serial cables

- DB-9 to RJ-45 console cable with DB-9 to USB adapter if necessary

Lab Software Requirements

- Tera Term
- Wireshark

Networking Essentials

Instructor Training Requirements

Instructor Training & Support:

1. Academies must align with an ASC.
2. Instructor Training is required.
 - Grant access to all existing CCNA 1 instructors, i.e. existing CCNA instructors eligible to teach CCNA ITN do not need to take instructor training
 - Other non-CCNA instructors need to join and pass instructor training conducted by ITC before teaching this course
 - Instructor candidates with current, valid CCNA R&S certifi valid CCENT or higher certification cation are eligible for Instructor Fast Track option. Contact your ITC Academy
 - All CCNA instructor trainers in ITC will be allowed to teach this course
 - Trainees can choose to take this course or take CCNA ITN course to get access for teaching this course.
3. Instructors can register for training with an ITC.



CCNA R&S

Instructor Training Requirements

Instructor Training & Support:

1. Academies must align with an ASC.
2. Instructor Training is required.
 - Instructor accredited during Limited Availability can continue to teach with no additional instructor training
 - New instructors will require training and accreditation by ITC
 - Instructor candidates with current, valid CCNA R&S certification are eligible for Instructor Fast Track option. Contact your ITC Academy
3. Instructors can register for training with an ITC.



Workshop-Protokoll

Networking Essentials

- „niedriges Niveau“
- kein Subnetting
- „IPv6 wird angeschitten“
- einzelne Übungen von CCNA1 werden „rübergezogen“ um einzelne Themen zu vertiefen (z. B. Subnetting)
- eher für Mechatroniker & Automatisierungstechniker
- leichteren Zugang eventuell für die Erwachsenenbildung oder für Quereinsteiger
- Entwicklung eines IP-Adressendesigns nicht möglich nach Abschluss des Kurses
- „liest sich einfacher“ (evtl. mehr Motivation?)

CCNA1

- „nicht zu schaffen in der Berufsschule“ (Umfang)
- kein Wireless-Kapitel
- „zu schwierig“
- kein DHCP und NAT (erst in CCNA2)
- für Fachinformatiker für Systemintegration geeignet
- Wireshark-Analysen kann man eventuell einsparen
- Sehr gute Vorbereitung auf das Industriezertifikat R&S

CCNA R&S: Teaching Methods and Materials

Moodle as one opportunity to provide more or individual information for study groups.

Kapitel 3: Dynamisches Routing

Wichtige Lerninhalte des Kapitels im Überblick:

- 3.1.1.1 Klassifizierung der Routing-Protokolle (2. Grafik)
- 3.1.1.2 Komponenten dynamischer Routing-Protokolle
- 3.1.2.3 Anwendungsfälle für dynamische Routing-Protokolle

Kapitel 3: Dynamisches Routing

- wichtige Lerninhalte
- Präsentation (ausführlich)
- Packet Tracer Übung: RIPv2
- Lösung PT RIPv2

RIP / RIPv2 Lab

- Einführung RIP Lab
- RIP / RIPv2 – Befehlsübersicht
- kohnlehome.de Routingprotokolle Übersicht
- RIPv2 Lab
- RIPv2 (IPv6) - Lab



- Moodle site with presentations and materials from teacher trainers
- IT Ess, Netw. Ess & CCNA R&S V6
- Access: <https://lehrerfortbildung-bw.de/moodle2/login/>
- Enrollment key for Cisco-Courses: ospfeigrpripv2

▼ Course 1 - Introduction to Networks

- ▶ Chapter 01 - Exploring the Network
- ▶ Chapter 02 - Configuring a Network Operating System
- ▶ Chapter 03 - Network Protocols and Communications
- ▶ Chapter 04 - Network Access