

# uCertify

## Course Outline

### Networking Essentials 6e



06 Aug 2024

1. Course Objective
2. Pre-Assessment
3. Exercises, Quizzes, Flashcards & Glossary  
Number of Questions
4. Expert Instructor-Led Training
5. ADA Compliant & JAWS Compatible Platform
6. State of the Art Educator Tools
7. Award Winning Learning Platform (LMS)
8. Chapter & Lessons  
Syllabus  
Chapter 1: Introduction  
Chapter 2: Introduction to Computer Networks  
Chapter 3: Physical Layer Cabling: Twisted-Pair  
Chapter 4: Physical Layer Cabling: Fiber Optics  
Chapter 5: Wireless Networking  
Chapter 6: Interconnecting the LANs  
Chapter 7: TCP/IP  
Chapter 8: Introduction to Router Configuration  
Chapter 9: Introduction to Switch Configuration  
Chapter 10: Routing Protocols  
Chapter 11: Managing the Network Infrastructure  
Chapter 12: Network Security  
Chapter 13: Cloud Computing and Virtualization  
Chapter 14: Codes and Standards  
Videos and How To
9. Practice Test  
Here's what you get  
Features

10. Live labs

Lab Tasks

Here's what you get

11. Post-Assessment

## 1. Course Objective

The Networking Essentials 6e course and lab cover the basics of computer networks to advanced concepts in Ethernet networks; router configuration; TCP/IP networks; routing protocols; local, campus, and wide area network configuration; network security; wireless networking; optical networks; Voice over IP; the network server; and Linux networking. The labs are cloud-based, device-enabled, and can easily be integrated with an LMS. The Networking Essentials 6e course and lab also provide knowledge on the areas such as network security and hardening, cloud networking, virtualization, 5G, and other recent advances in wireless technology, infrastructure management, and current hardware and devices.

## 2. Pre-Assessment

Pre-Assessment lets you identify the areas for improvement before you start your prep. It determines what students know about a topic before it is taught and identifies areas for improvement with question assessment before beginning the course.

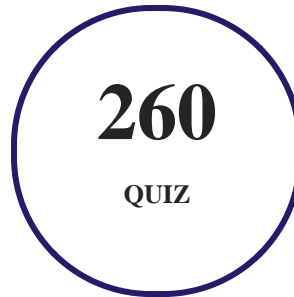
## 3. Exercises

There is no limit to the number of times learners can attempt these. Exercises come with detailed remediation, which ensures that learners are confident on the topic before proceeding.

**320**  
EXERCISES

## 4. Quiz

Quizzes test your knowledge on the topics of the exam when you go through the course material. There is no limit to the number of times you can attempt it.



## 5. flashcards

Flashcards are effective memory-aiding tools that help you learn complex topics easily. The flashcard will help you in memorizing definitions, terminologies, key concepts, and more. There is no limit to the number of times learners can attempt these. Flashcards help master the key concepts.



## 6. Glossary of terms

uCertify provides detailed explanations of concepts relevant to the course through Glossary. It contains a list of frequently used terminologies along with its detailed explanation. Glossary defines the key terms.



## 7. Expert Instructor-Led Training

uCertify uses the content from the finest publishers and only the IT industry's finest instructors. They have a minimum of 15 years real-world experience and are subject matter experts in their fields. Unlike a live class, you can study at your own pace. This creates a personal learning experience and gives you all the benefit of hands-on training with the flexibility of doing it around your schedule 24/7.

## 8. ADA Compliant & JAWS Compatible Platform

uCertify course and labs are ADA (Americans with Disability Act) compliant. It is now more accessible to students with features such as:

- Change the font, size, and color of the content of the course
- Text-to-speech, reads the text into spoken words
- Interactive videos, how-tos videos come with transcripts and voice-over
- Interactive transcripts, each word is clickable. Students can clip a specific part of the video by clicking on a word or a portion of the text.

JAWS (Job Access with Speech) is a computer screen reader program for Microsoft Windows that reads the screen either with a text-to-speech output or by a Refreshable Braille display. Student can easily navigate uCertify course using JAWS shortcut keys.

## 9. State of the Art Educator Tools

uCertify knows the importance of instructors and provide tools to help them do their job effectively. Instructors are able to clone and customize course. Do ability grouping. Create sections. Design grade scale and grade formula. Create and schedule assessments. Educators can also move a student from self-paced to mentor-guided to instructor-led mode in three clicks.

## 10. Award Winning Learning Platform (LMS)

uCertify has developed an award winning, highly interactive yet simple to use platform. The SIIA CODiE Awards is the only peer-reviewed program to showcase business and education technology's finest products and services. Since 1986, thousands of products, services and solutions have been

recognized for achieving excellence. uCertify has won CODiE awards consecutively for last 7 years:

- **2014**

1. Best Postsecondary Learning Solution

- **2015**

1. Best Education Solution
2. Best Virtual Learning Solution
3. Best Student Assessment Solution
4. Best Postsecondary Learning Solution
5. Best Career and Workforce Readiness Solution
6. Best Instructional Solution in Other Curriculum Areas
7. Best Corporate Learning/Workforce Development Solution

- **2016**

1. Best Virtual Learning Solution
2. Best Education Cloud-based Solution
3. Best College and Career Readiness Solution
4. Best Corporate / Workforce Learning Solution
5. Best Postsecondary Learning Content Solution
6. Best Postsecondary LMS or Learning Platform
7. Best Learning Relationship Management Solution

- **2017**

1. Best Overall Education Solution
2. Best Student Assessment Solution
3. Best Corporate/Workforce Learning Solution
4. Best Higher Education LMS or Learning Platform

- **2018**

1. Best Higher Education LMS or Learning Platform

2. Best Instructional Solution in Other Curriculum Areas
3. Best Learning Relationship Management Solution

- **2019**

1. Best Virtual Learning Solution
2. Best Content Authoring Development or Curation Solution
3. Best Higher Education Learning Management Solution (LMS)

- **2020**

1. Best College and Career Readiness Solution
2. Best Cross-Curricular Solution
3. Best Virtual Learning Solution

## 11. Chapter & Lessons

uCertify brings these textbooks to life. It is full of interactive activities that keeps the learner engaged. uCertify brings all available learning resources for a topic in one place so that the learner can efficiently learn without going to multiple places. Challenge questions are also embedded in the chapters so learners can attempt those while they are learning about that particular topic. This helps them grasp the concepts better because they can go over it again right away which improves learning.

Learners can do Flashcards, Exercises, Quizzes and Labs related to each chapter. At the end of every lesson, uCertify courses guide the learners on the path they should follow.

### Syllabus

#### Chapter 1: Introduction

- About This eBook

#### Chapter 2: Introduction to Computer Networks



- Introduction
- Network Topologies
- The OSI Model
- The Ethernet LAN
- Home Networking
- Assembling an Office LAN
- Testing and Troubleshooting a LAN
- Summary
- Questions and Problems

### Chapter 3: Physical Layer Cabling: Twisted-Pair

- Introduction
- Structured Cabling
- Twisted-Pair Cable
- Terminating Twisted-Pair Cables
- Cable Testing and Certification
- 10 Gigabit Ethernet over Copper
- Troubleshooting Cabling Systems

- Summary
- Questions and Problems

## Chapter 4: Physical Layer Cabling: Fiber Optics

- Introduction
- The Nature of Light
- Fiber Attenuation and Dispersion
- Optical Components
- Optical Networking
- Safety
- Troubleshooting Fiber Optics: The OTDR
- Summary
- Questions and Problems

## Chapter 5: Wireless Networking

- Introduction
- The IEEE 802.11 Wireless LAN Standard
- 802.11 Wireless Networking
- Bluetooth, WiMAX, RFID, and Mobile Communications

- Configuring a Point-to-Multipoint Wireless LAN: A Case Study
- Troubleshooting Wireless Networks
- Summary
- Questions and Problems

## Chapter 6: Interconnecting the LANs

- Introduction
- The Network Bridge
- The Network Switch
- The Router
- The Console Port Connection
- Interconnecting LANs with the Router
- Interconnecting LANs and WANs
- Summary
- Questions and Problems

## Chapter 7: TCP/IP

- Introduction

- The TCP/IP Layers
- Number Conversion
- IPv4 Addressing
- Subnet Masks: Subnetting and Supernetting
- Supernetting, CIDR Blocks, and VLSM
- IPv6 Addressing
- Summary
- Questions and Problems

## Chapter 8: Introduction to Router Configuration

- Introduction
- Router Fundamentals
- The Router's User EXEC Mode (Router>)
- The Router's Privileged EXEC Mode (Router#)
- Configuring the Network Interface: Auto-negotiation
- Troubleshooting the Router Interface
- Summary
- Questions and Problems

## Chapter 9: Introduction to Switch Configuration

- Introduction
- Introduction to VLANs
- Introduction to Switch Configuration
- VLAN Subinterfaces
- Spanning Tree Protocol
- Power over Ethernet
- Troubleshooting the Switch Interface
- Summary
- Questions and Problems

## Chapter 10: Routing Protocols

- Introduction
- Static Routing
- Dynamic Routing Protocols
- Distance Vector Protocols
- Configuring RIP and RIPv2
- Link-State Protocols

- Configuring the Open Shortest Path First (OSPF) Routing Protocol
- Advanced Distance Vector Protocol: Configuring Enhanced Interior Gateway Routing Protocol (EIGRP)
- Internet Routing with Border Gateway Protocol (BGP)
- IPv6 Routing
- Summary
- Questions and Problems

## Chapter 11: Managing the Network Infrastructure

- Introduction
- Domain Name and IP Address Assignment
- IP Address Management with DHCP
- Scaling a Network with NAT and PAT
- Domain Name System (DNS)
- Network Management Protocols
- Analyzing Network Traffic
- Network Analyzer: Wireshark
- Analyzing Computer Networks: FTP Data Packets

- Troubleshooting IP Networks
- Summary
- Questions and Problems

## Chapter 12: Network Security

- Introduction
- Intrusion: How Attackers Gain Control of a Network
- Denial-of-Service
- Security Software and Hardware
- Managing Network Access
- Router Security
- Switch Security
- Wireless Security
- Remote Access and VPN Technologies
- Physical Security
- Summary
- Questions and Problems

## Chapter 13: Cloud Computing and Virtualization

- Introduction
- Virtualization
- Cloud Computing
- Enterprise Storage
- Summary
- Questions and Problems

## Chapter 14: Codes and Standards

- Introduction
- Safety Standards and Codes
- Industry Regulatory Compliance
- Business Policies, Procedures, and Other Best Practices
- Business Continuity and Disaster Recovery
- Summary
- Questions and Problems

## 12. Practice Test



## Here's what you get

**100**

PRE-ASSESSMENTS QUESTIONS

**100**

POST-ASSESSMENTS QUESTIONS

## Features

Each question comes with detailed remediation explaining not only why an answer option is correct but also why it is incorrect.

### Unlimited Practice

Each test can be taken unlimited number of times until the learner feels they are prepared. Learner can review the test and read detailed remediation. Detailed test history is also available.

Each test set comes with learn, test and review modes. In learn mode, learners will attempt a question and will get immediate feedback and complete remediation as they move on to the next question. In test mode, learners can take a timed test simulating the actual exam conditions. In review mode, learners can read through one item at a time without attempting it.

## 13. Live Labs

The benefits of live-labs are:

- Exam based practical tasks
- Real equipment, absolutely no simulations
- Access to the latest industry technologies
- Available anytime, anywhere on any device
- Break and Reset functionality

- No hardware costs

## Lab Tasks

### **Introduction to Computer Networks**

- Assembling Components to Complete the Workstation
- Using the ping Utility

### **Physical Layer Cabling: Twisted-Pair**

- Connecting Patch Cables between the Patch Panel and Switch Ports

### **Wireless Networking**

- Connecting a Wireless Router to a Laptop

### **Interconnecting the LANs**

- Connecting a Hub to a Switch

### **Introduction to Router Configuration**

- Using the Basic Router Configuration

### **Introduction to Switch Configuration**

- Configuring VLAN
- Using the Basic Switch Configuration

### **Routing Protocols**

- Configuring Static and RIP Routing
- Configuring RIPv2 Routing

- Configuring OSPF
- Configuring EIGRP
- Configuring IPv6 Static Routes

### **Managing the Network Infrastructure**

- Configuring Network Address Translation
- Configuring Port Address Translation
- Capturing a Packet Using Wireshark

### **Network Security**

- Configuring Outbound Rules for a Firewall
- Configuring Inbound Rules for a Firewall

### **Cloud Computing and Virtualization**

- Creating a Virtual Switch

### **Codes and Standards**

- Configuring a Default Domain Password Policy

## **Here's what you get**




## **14.** **Post-Assessment**


After completion of the uCertify course Post-Assessments are given to students and often used in conjunction with a Pre-Assessment to measure their achievement and the effectiveness of the exam.

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