



This course supports the assessment for Network and Security - Foundations. The course covers 3 competencies and represents 3 competency units.

Introduction

Overview

We live in an interconnected world. Computer networks and their security are critical to most modern organizations of any size. In this course, you will be introduced to the components of a computer network and the concept and role of communication protocols. You will learn about widely used categorical classifications of networks (i.e LAN, CAN, MAN, WAN), as well as network topologies and physical devices. The course will also introduce you to basic concepts of security, covering vulnerabilities of networks and mitigation techniques, security of physical media, and security policies and procedures.

Watch the following video introduction for this course:

Competencies

This course provides guidance to help you demonstrate the following 3 competencies:

- **Competency 4014.1.1: Introduction to Networking Concepts**
The graduate identifies the basic concepts essential to networking.
- **Competency 4014.1.2: Networking Operations and Technology**
The graduate identifies the functional and technical components of network systems.
- **Competency 4014.1.3: Introduction to Network Security**
The graduate identifies the basic concepts essential to network security.

Course Instructor Assistance

As you prepare to successfully demonstrate competency in this subject, remember that course instructors stand ready to help you reach your educational goals. As subject matter experts, mentors enjoy and take pride in helping students become reflective learners, problem solvers, and critical thinkers. Course instructors are excited to hear from you and eager to work with you.

Successful students report that working with a course instructor is the key to their success. Course instructors are able to share tips on approaches, tools, and skills that can help you apply the content you're studying. They also provide guidance in assessment preparation strategies and troubleshoot areas of deficiency. Even if things don't work out on your first try, course instructors act as a support system to guide you through the revision process. You should expect to work with course instructors for the duration of your coursework, and you are encouraged to contact them as soon as you begin. Course instructors are fully committed to your success!

Preparing for Success

The information in this section is provided to detail the resources available for you to use as you complete this course.



Learning Resources

The learning resources listed in this section are required to complete the activities in this course. For many resources, WGU has provided automatic access through the course. However, you may need to manually enroll in or independently acquire other resources. Read the full instructions provided to ensure that you have access to all of your resources in a timely manner.

Getting Started

Watch the following video for information on how to get started in this course.

Automatically Enrolled Resources

You can access the learning resources listed in this section by clicking on the links provided throughout the course. You may be prompted to log in to the WGU student portal to access the resources.

uCertify

All of the course content will be found within the following uCertify course:

- [Network and Security - Foundations](#)

The course is structured in such a way as to match your preassessment and objective assessment reports; each uCertify lesson corresponds to each assessment topic, that way, based on the results of your preassessment, you will know exactly which areas need the majority of your attention before taking the final exam.

Note: The textbook used in this course was written with the CompTIA network+ certification exam in mind. However, this course is designed to prepare you for a WGU assessment and not a third-party certification.

Complete the Preassessment

If you believe you have previous knowledge of some or all topics covered in this course, start by taking the preassessment before you begin and use its results to focus your studies.

- Complete the preassessment located in the Assessment tab.

Course instructors can help you develop a study plan based on your preassessment results.

Pacing Guide

The pacing guide suggests a weekly structure to pace your completion of learning activities. It is provided as a suggestion and does not represent a mandatory schedule. Follow the pacing guide carefully to complete the course in the suggested timeframe.



Week 1

- Introduction to Computer Networks
 - Lesson 1
- Physical Layer Cabling: Twisted Pair
 - Lesson 2

Week 2

- Physical Layer Cabling: Fiber Optics
 - Lesson 3
- Wireless Networking
 - Lesson 4

Week 3

- Interconnecting the LANS and TCP/IP
 - Lesson 5
 - Lesson 6

Week 4

- Network Security
 - Lesson 7 in the course

Week 5

- Review
 - Practice Tests and Post Assessment, scoring 90% in Test Mode

Week 6

- Review
 - Take the WGU Pre-Assessment scoring 85% or higher
 - Take the WGU Objective Assessment scoring above 69%

Note: This pacing guide does not replace the course. Please continue to refer to the course for a comprehensive list of the resources and activities.

Network Fundamentals

In this section you will learn about the basic concepts that surround networking,

Network Fundamentals

Network professionals need a way to describe the shape and design of networks. These are known as network topologies. Topologies are not the only relevant factor when describing a network. While topologies are determined by the shape of the data flow, network classifications



are determined by its size. Familiarity with the numerous ways to interconnect devices, and understanding their strengths and limitations, will enable you to choose the right network for each situation. It will also allow you to optimize systems designed to run on a particular network.

This topic addresses the following competency:

- **Competency 4014.1.1: Introduction to Networking Concepts**

The graduate identifies the basic concepts essential to networking.

This topic highlights the following objectives:

- Identify various network topologies.
- Describe categorical classifications of networks including LAN, MAN, WAN, CAN.
- Describe each of the seven layers of the OSI reference model.
- Identify different types of networking cables.

Read: Chapters 1, 2, and 3 in uCertify

Read the following chapters in uCertify:

- [chapter 1 \("Introduction to Computer Networks"\)](#)
- [chapter 2 \("Physical Layer Cabling: Twisted Pair"\)](#)
- [chapter 3 \("Physical Layer Cabling: Fiber Optics"\)](#)

Practice: Network Fundamentals

Complete the exercises for the following chapters in uCertify:

- [chapter 1 \("Introduction to Computer Networks"\)](#)
- [chapter 2 \("Physical Layer Cabling: Twisted Pair"\)](#)
- [chapter 3 \("Physical Layer Cabling: Fiber Optics"\)](#)

Self-Check: Network Fundamentals

Complete the quizzes for the following chapters in uCertify:

- [chapter 1 \("Introduction to Computer Networks"\)](#)
- [chapter 2 \("Physical Layer Cabling: Twisted Pair"\)](#)
- [chapter 3 \("Physical Layer Cabling: Fiber Optics"\)](#)

Network devices

In addition to the many connected devices on a network, there are critical devices required for interconnecting networks. In this section you will learn the terms and functions of key devices.

This topic addresses the following competency:

- **Competency 4014.1.2: Networking Operations and Technology**



The graduate identifies the functional and technical components of network systems.

This topic highlights the following objectives:

- Identify key terms associated with interconnecting the LANs.
- Identify functions of devices for interconnecting LANs.
- Describe the role of different devices used for interconnecting LANs including: bridge, switch, and router.

Read: Chapter 5 in uCertify

Read the following chapter in uCertify:

- [chapter 5 \("Interconnecting the LANs"\)](#)

Practice: Network Devices

Complete the exercises for the following chapter in uCertify:

- [chapter 5 \("Interconnecting the LANs"\)](#)

Self-Check: Network Devices

Complete the quizzes for the following chapter in uCertify:

- [chapter 5 \("Interconnecting the LANs"\)](#)

Networking Operations and Technology

In this section you will learn how to identify the functional and technical components of network systems.

Wireless Networks

Wireless networks are present in almost every home and business. This section will introduce you the most common Wireless LAN Standard, namely IEEE 802.11 and its related family. Wireless networks are made up of key components. Those components are best deployed after conducting a site survey, which will also be discussed in this section.

This topic addresses the following competency:

- **Competency 4014.1.2: Networking Operations and Technology**
The graduate identifies the functional and technical components of network systems.

This topic highlights the following objectives:

- Define key terms of the 802.11 Wireless LAN standard.
- Identify standards within the 802.11 family.
- Describe components of the wireless LAN.
- Describe the purpose and considerations of site surveys.

Read: Chapter 4 in uCertify



Read the following chapter in uCertify:

- [chapter 4 \(“Wireless Networking”\)](#)

Practice: Network Devices

Complete the exercises for the following chapter in uCertify:

- [chapter 4 \(“Wireless Networking”\)](#)

Self-Check: Network Devices

Complete the quizzes for the following chapter in uCertify:

- [chapter 4 \(“Wireless Networking”\)](#)

The TCP/IP Model

The networking model used for the Internet and similar networks is called the TCP/IP model or Internet protocol suite. The model name is derived from its most important protocols—the Transmission Control Protocol (TCP) and the Internet Protocol (IP). In this section you will learn about this model and its application everywhere, from home networking to the internet.

This topic addresses the following competency:

- **Competency 4014.1.2: Networking Operations and Technology**
The graduate identifies the functional and technical components of network systems.

This topic highlights the following objectives:

- Describe the four layers of the TCP/IP model.
- Compare connection-oriented and connectionless protocols.
- Define how TCP/IP connections are established, maintained, and terminated.
- Define the five classes of IPv4 addresses.
- Recognize the structure of an IPv6 address.
- Describe the need for IPv6.
- Analyze business requirements in terms of subnetting or supernetting.

Read: Chapter 6 in uCertify

Read the following chapter in uCertify:

- [chapter 6 \(“TCP/IP”\)](#)

Practice: Network Devices

Complete the exercises for the following chapter in uCertify:

- [chapter 6 \(“TCP/IP”\)](#)

Self-Check: Network Devices



Complete the quizzes for the following chapter in uCertify:

- [chapter 6 \(TOP\)](#)

Introduction to Network Security

In this section, you will identify the basic concepts essential to network security.

Network Security

In this section you will learn key terms and critical concepts of information and network security. You will also learn the different ways an attacker can gain control of a network and how the denial of service attacks are initiated. You will learn about security hardware and software used to protect networks, VPN implementations, and their key protocols.

This topic addresses the following competency:

- **Competency 4014.1.3: Introduction to Network Security**
The graduate identifies the basic concepts essential to network security.

This topic highlights the following objectives:

- Define the key terms and critical concepts of information and network security.
- Identify ways an attacker can gain control of a network.
- Explore how denial of service attacks are initiated.
- Describe security hardware and software used to protect a network.
- Describe VPN implementations and key protocols.

Read: Chapter 7 in uCertify

Read the following chapter in uCertify:

- [chapter 7 \("Network Security"\)](#)

Practice: Network Devices

Complete the exercises for the following chapter in uCertify:



Self-Check: Network Devices

Complete the quizzes for the following chapter in uCertify:





Final Steps

Congratulations on completing the activities in this course! This course has prepared you to complete the assessment associated with this course. If you have not already been directed to complete the assessment, schedule and complete your assessment now.

Complete the Preassessment

The preassessment can help you determine your level of preparation. It is highly recommended that you pass the preassessment before attempting the final exam.

- Complete the preassessment located in the Assessment tab.

Course instructors can help you develop a review plan based on your preassessment results.

First Attempt Checklist

One of the many things that makes WGU unique is its competency-based education model. If you know the material, all you have to do is prove it by passing the exam. If you can do this, you can accelerate the receipt of your degree.

To make sure you have the best chance possible to pass the exam on your first attempt, the following steps should be completed successfully before you take it:

1. Complete the WGU preassessment under the Assessment tab. Use the coaching report to determine which topics you are already strongest on.
2. Complete the preassessment in uCertify.
3. Complete all chapters and lessons in uCertify.
4. Watch all uCertify videos and take notes on the content.
5. Complete all chapter quizzes and exercises in "Test Mode", scoring 90% or higher.
6. Complete all 4 practice tests in "Test Mode", scoring 90% or higher.
7. Complete the postassessment in "Test Mode", scoring a 90% or higher.
8. Complete the WGU preassessment under the Assessment tab, striving for 85% or higher. Use the coaching report to determine where you still need to review and reach out to the course instructors with any questions you have.

If you have completed the steps above and you feel comfortable with all of the concepts presented, you are most likely ready to attempt the exam.

If you fail your first attempt, you will be required to contact the course instructor to see what went wrong and how you can prepare to ensure a successful second attempt. After determining you are ready, your course instructor will approve your request once to make another exam attempt.