

## Certified Wireless Network Administrator - CWNA (CWNA)

ID CWNA Price 2,290.— €(excl. tax) Duration 4 days

### Our CWNA success guarantee

The course price for the CWNA training includes an exam voucher for the corresponding certification. Our wireless experts will prepare you specifically and comprehensively for the CWNA exam. We are convinced that you will successfully pass the CWNA exam after completing the training – the experience of our previous participants confirms this.

If you still fail the exam, we offer you the opportunity to take part in one of our next CWNA courses free of charge. In this case, please [contact us](#) within seven days of your exam date at the latest to discuss how to proceed. Please note that no additional exam voucher is included when you take the course again.

### Advantages of CWNA certification

- **Proof of in-depth knowledge** about the management and optimization of WLAN networks
- **Career advantage** through an internationally recognized certification that confirms expertise in wireless networks
- **Expanded career prospects** in a growing area of network technology
- **Improved problem-solving skills** in WLAN administration and security

### Course Overview

The CWNA (Certified Wireless Network Administrator) training provides the knowledge and practical skills to efficiently plan, implement, monitor and manage wireless networks. The manufacturer-independent, four-day course focuses on current technologies such as WiFi 6 and WiFi 7 and offers in-depth knowledge of antenna technology, radiation technology and measurement technology. Planning aspects and implementation details are covered in detail.

The CWNA training covers all essential aspects of WLAN technology, in particular:

- **WLAN basics:** Understanding the basic concepts of WLANs, radio technologies and wireless standards

(802.11)

- **Radio frequency (RF) and antenna technology:** Introduction to how radio waves work, the importance of frequencies, signal strength and antenna types and their influence on network capacity and range
- **WLAN architecture:** Learn the structure of a wireless network, including WLC, access points, tunneling methods, clients, different WLAN topologies and their design principles
- **WLAN security:** Detailed consideration of security protocols such as WPA2, WPA3, and 802.1X as well as strategies for securing wireless networks against unauthorized access
- **WLAN planning and implementation:** Planning and implementation of WLAN networks, capacity planning and the selection of suitable devices and technologies
- **Troubleshooting and performance optimization:** Methods for diagnosing and resolving WLAN problems, performance analysis and network adjustments for a stable and efficient connection
- **Regulation and compliance:** Understanding of the relevant regulations and standards affecting WLAN installations, including the legal requirements for wireless communications

### Who should attend

The CWNA training course is aimed at network administrators, system engineers, IT professionals and anyone who is or will be involved in the administration and implementation of WLAN networks. It is suitable for both beginners and experienced professionals who want to update their knowledge to the latest state of the art.

### This course is part of the following Certifications

Certified Wireless Network Administrator (CWNA)

### Prerequisites

Students should have basic networking knowledge, including understanding of the OSI Reference model and IP subnetting.

Wireless basics at the level of the course [Wireless Fundamentals 1 \(WFUN1\)](#)

## Course Objectives

Upon completing this course, the learner will be able to meet these overall objectives:

- Introduction to 802.11 WLANs
- Radio Frequency Fundamentals
- Understand international, regional, and local RF spectrum management organizations
- Basic WLAN Analysis
- Coordinating 802.11 Frame Transmissions
- RF Math and System Operating Margin
- 802.11 Service Sets
- Challenges addressed by 802.11n
- Wireless LAN Operation
- WLAN Security
- Site Surveying
- Antennas

## Course Content

The Certified Wireless Network Administrator - CWNA 4.0 course provides the networking professional a complete foundation of knowledge for entering into or advancing in the wireless networking industry. From basic RF theory to 802.11 frame exchange processes, this course delivers hands-on training that will benefit the novice as well as the experienced network professional.

## Detailed Course Outline

### Hands-on Lab Exercises

#### Spectrum Capture and Analysis

- Installing spectrum analyzer software
- Performing and analyzing a capture
- Swept Spectrogram
- Real Time FFT
- FFT Duty Cycle
- Channel Utilization
- Interference with Wi-Fi Channels
- Interfering Device Discovery

#### Infrastructure Mode Throughput Analysis

- Section A: Greenfield mode throughput (802.11b vs. g vs. a

vs. n)

- Section B: Mixed mode throughput
- Section C: Adjacent and co-channel interference
- Understanding speeds and feeds of Wi-Fi technologies

#### Using Laptop Analyzers

- Using laptop analyzers for WLAN discovery and protocol analysis.
- Understanding security and performance related protocol analysis
- Installing and configuring a WLAN discovery tool.
- Installing and configuring a laptop protocol analyzer
- Locating 2.4 GHz and 5 GHz WLANs
- Capturing and analyzing Management, Control, and Data frames
- Capturing and analyzing a WPA2-Personal authentication
- A protocol analyzer is provided on the student CD

#### Site Survey

- Classes of site survey methodology
- Section A: Manual site surveys (sometimes called the walkabout)
- Section B: Predictive analysis (sometimes called automated site surveying)
- Manual site surveying
- Active mode vs passive mode
- Predictive analysis software tools

#### Basic WLAN Security

- WPA compliant
- WPA2 compliant
- Personal vs Enterprise
- TKIP encryption
- 802.11i compliant CCMP
- 802.1X/EAP authentication

#### Wireless Intrusion Prevention Systems

- security monitoring
- performance monitoring
- reporting
- Installation and configuration of WIPS
- Properly classifying authorized, rogue/unauthorized, and external/interfering access points or clients
- Event monitoring and notification
- Identifying and mitigating rogue devices

## Course Outline

## Introduction to 802.11 WLANs

- Discuss the standards organizations responsible for shaping the 802.11 Wireless LAN protocol
- Learn how standards compliance is enforced for 802.11 WLAN vendors
- Examine the 802.11 standard and various amendments
- Discuss additional networking standards that are commonly used to enhance 802.11 WLANs

## Radio Frequency Fundamentals

- Physical aspects of RF propagation
- Types of losses and attenuation that affect RF communications
- Types of modulation and coding schemes (MCS) used for 802.11 communications
- How channels and bandwidth are related to each other in wireless networks
- Types of Spread Spectrum used in wireless networking
- RF Power Output Regulations

## Understand international, regional, and local RF spectrum management organizations

- Understand RF channels in the unlicensed 2.4 GHz and 5 GHz frequency ranges
- Understand how power output limitations are enforced by the FCC for Point-to-Multipoint (PtMP) and Point-to-Point (PtP) wireless connections

## Power over Ethernet

- Recognize the two types of devices used in Power over Ethernet (PoE)
- Recognize the differences between the two types of Power Sourcing Equipment (PSE)
- Understand the two ways in which power can be delivered using PoE
- Understand the importance of planning to maximize the efficiency of Power over Ethernet
- Understand the two standards currently available for PoE
- Powering 802.11n APs

## Basic WLAN Analysis

- Protocol Analysis
- 802.11 Frame Types
- Data Frames
- Control Frames
- Management Frames
- Protection Mechanisms

- Legacy Power Saving operations
- Transmission Rates

## Coordinating 802.11 Frame Transmissions

- Differences between CSMA/CD and CSMA/CA
- Distributed Coordination Function (DCF)
- Network Allocation Vector (NAV)
- Clear Channel Assessment (CCA)
- Interframe Spacing (IFS)
- Contention Window (CW)
- Quality of Service in 802.11 WLANs
- Point Coordination Function (PCF)
- Hybrid Coordination Function (HCF)

## RF Math and System Operating Margin

- RF units of measure
- Basic RF mathematics
- RF signal measurements
- Understand link budgets

## 802.11 Service Sets

- Three types of service sets defined for use within 802.11 WLANs
- 802.11 authentication and association
- 802.11 network infrastructure
- Roaming within a WLAN
- Load-balancing as a method to improve congestion in WLANs
- The 802.11n Amendment

## Challenges addressed by 802.11n

- 802.11n PHY/MAC layer enhancements
- MIMO and SISO systems
- 802.11n coexistence mechanisms
- 802.11n integration and deployment considerations
- 802.11n site surveying and analysis

## Wireless LAN Operation

- WLAN Hardware Devices
- WLAN Software
- Architecture Types and Evolution
- Ad Hoc & Infrastructure Connectivity Operation
- AP Modes
- Bridging & Repeating
- Mesh Networking
- WLAN Controller Deployments
- WLAN Profiles

- Multichannel Architecture (MCA)
- Single Channel Architecture (SCA)
- WLAN Management Systems (WNMS)

#### **WLAN Security**

- The Importance of WLAN Security
- Security Policy
- Legacy WLAN Security Mechanisms
- Modern WLAN Security Mechanisms
- Baseline WLAN Security Practices

#### **Site Surveying**

- Defining an RF site survey
- Spectrum Analysis
- Types of RF site surveys
- Manual RF site surveys
- Predictive Modeling
- Dense AP deployments

#### **Antennas**

- Types of antennas and antenna systems commonly used in 802.11 WLANs
- Antenna Polarization and Gain
- Antenna implementation and safety
- Types of antenna cables, connectors, and other accessories

# About Fast Lane



Fast Lane is a global, award-winning specialist in technology and business training as well as consulting services for digital transformation. As the only global partner of the three cloud hyperscalers- Microsoft, AWS and Google- and partner of 30 other leading IT vendors, Fast Lane offers qualification solutions and professional services that can be scaled as needed. More than 4,000 experienced Fast Lane professionals train and advise customers in organizations of all sizes in 90 countries worldwide in the areas of cloud, artificial intelligence, cyber security, software development, wireless and mobility, modern workplace, as well as management and leadership skills, IT and project management.

## Fast Lane Services

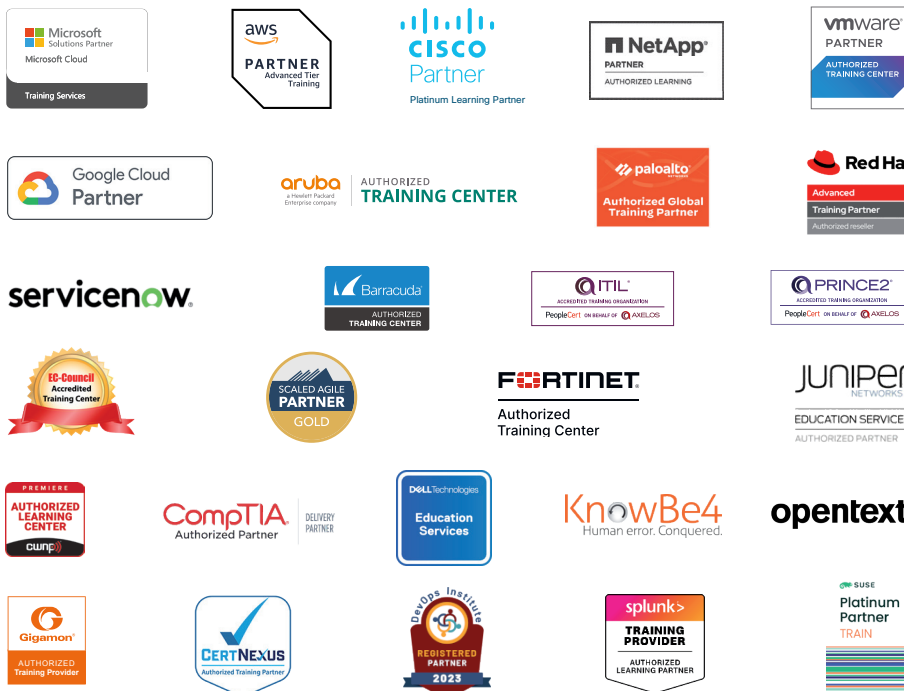
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- ✓ Managed Training Services
- ✓ Digital Learning Solutions
- ✓ Content Development
- ✓ Remote Labs
- ✓ Talent Programs
- ✓ Event Management Services

## Training Methods

- ✓ Classroom Training
- ✓ Instructor-Led Online Training
- ✓ FLEX Classroom – Classroom & Online Hybrid
- ✓ Onsite & Customized Training
- ✓ E-Learning
- ✓ Blended & Hybrid Learning
- ✓ Mobile Learning

## Technologies & Solutions

- ✓ Digital Transformation
- ✓ Artificial Intelligence
- ✓ Cloud
- ✓ Networking
- ✓ Cyber Security
- ✓ Wireless & Mobility
- ✓ Modern Workplace
- ✓ Data Center



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