

# CWNA



# Enterprise WLAN Administration (CWNA)

The Wireless LAN Administration 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.

## Course Objectives

By the end of the course, you will understand and will have been tested on, the following concepts:

- WL RF principles and introduction to various standards bodies
- WLAN topologies and technologies
- Implications of antenna communication
- Discussion 802.11 WLAN protocols
- Additional Wireless Technologies
- Traffic flow and packet delivery from a wireless network to a wired network
- Wireless networks architecture and controllers
- Simple network configuration and monitoring with WLAN Controller
- Understanding and securing wireless clients

Maintaining and troubleshooting wireless networks

## Course Prerequisites

Basic networking knowledge, including OSI model and IP subnetting

## Who Should Attend

- IT professionals and network engineers responsible for installing or supporting 802.11 Wireless networks.
- IT professionals wanting to progress into the wireless network industry.
- Wireless Network planners, designers and support staff.
- Selected IT Security staff, managers and auditors responsible for IT security policy.

## Course Duration

48 Hours, 16 Classes, 3 Hours per Class

# Course Details

## Lesson 01: 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

## Lesson 02: 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

## Lesson 03: 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

## Lesson 04: RF Math and System Operating Margin

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

## Lesson 05: 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

## Lesson 06: 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)

## Lesson 07: 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

# Course Details

## Lesson 08: 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

## Lesson 09: Basic WLAN Analysis

- Protocol Analysis
- 802.11 Frame Types
- Data Frames
- Control Frames
- Management Frames
- Protection Mechanisms
- Legacy Power Saving operations
- Transmission Rates

## Lesson 10: 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)

## Lesson 11: 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

## Lesson 12: Site Surveying

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

## Lesson 13: WLAN Security

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

