CWS-100 Objectives

The Certified Wireless Specialist (CWS) is an individual who can explain basic features and capabilities of wireless LAN (WLAN) solutions including APs, controllers, WLAN management solutions and 802.11 networks. The individual can assist in selecting the best equipment for a deployment or communicate well with those who are responsible for such decisions. The individual is not responsible for the configuration and management of the WLAN, but must have the ability to gather information to determine requirements and match technologies to those requirements for a deployment. A CWS can speak and understand the language of Wi-Fi.

Knowledge Domain	**Percentage**
Understand Basic RF Hardware and Functions	15%
Identify 802.11 Features and Functions	30%
Identify Wireless LAN Hardware and Software	30%
Understand Organizational Goals	25%

Understand Basic RF Hardware and Functions (15%)

1.1 Identify RF characteristics
- 1.1.1 RF waves
- 1.1.2 Amplitude
- 1.1.3 Frequency
- 1.1.4 Wavelength

1.2 Explain basic RF behaviors
- 1.2.1 Reflection
- 1.2.2 Absorption
- 1.2.3 Signal strength

1.3 Understand antenna types
- 1.3.1 Omnidirectional
- 1.3.2 Semi-directional
- 1.3.3 Highly directional
- 1.3.4 Internal vs. external

Identify 802.11 Features and Functions (30%)

2.1 Know the frequency bands used
- 2.1.1 2.4 GHz – 802.11b/g/n
- 2.1.2 5 GHz – 802.11a/n/ac
- 2.1.3 Sub-1 GHz – 802.11ah
- 2.1.4 60 GHz – 802.11ad

2.2 Identify Physical Layer (PHY) characteristics
- 2.2.1 Data rates
- 2.2.2 Bands used
- 2.2.3 Supported technologies (laptops, tablets, video devices, Internet of Things (IoT))

2.3 Select appropriate channels
- 2.3.1 Channel selection best practices
- 2.3.2 Common channel selection mistakes

2.4 Identify factors impacting wireless LAN (WLAN) performance
- 2.4.1 Coverage requirements
- 2.4.2 Capacity requirements
- 2.4.3 Required features
- 2.4.4 Poor configuration and implementation

2.5 Explain the basic differences between WPA and WPA2 security
- 2.5.1 Authentication and key management
- 2.5.2 Encryption
- 2.5.3 Personal vs. Enterprise

2.6 Describe features of enhanced 802.11 functions
- 2.6.1 Mesh
- 2.6.2 Quality of Services (QoS)
- 2.6.3 SISO vs. MIMO
- 2.6.4 Dynamic Rate Switching (DRS)
- 2.6.5 Backwards compatibility

Identify Wireless LAN Hardware and Software (30%)

3.1 Identify AP features and capabilities
- 3.1.1 PHY support
- 3.1.2 Single-band vs. dual-band
- 3.1.3 Output power control
- 3.1.4 Operational modes
- 3.1.5 Multiple-SSID support
- 3.1.6 Guest access
- 3.1.7 Security features
- 3.1.8 Management interfaces
- 3.1.9 Internal and external antennas
- 3.1.10 PoE support

3.2 Describe AP management systems
- 3.2.1 Autonomous
- 3.2.2 Controller

- 3.2.3 Cloud
- 3.2.4 Management systems

3.3 Determine capabilities of client devices
- 3.3.1 PHY support
- 3.3.2 Single-band vs. multi-band
- 3.3.3 Support for MIMO
- 3.3.4 Supported channels in 5 GHz
- 3.3.5 Supported security options

3.4 Identify when Power over Ethernet (PoE) should be used

3.5 Explain the requirements of fast and secure roaming for non-technical professionals
- 3.5.1 Latency requirements for streaming communications
- 3.5.2 Pre-authentication
- 3.5.3 Key caching methods

3.6 Understand the basic requirements for voice over WLAN (VoWLAN)
- 3.6.1 Latency
- 3.6.2 Jitter
- 3.6.3 Signal strength

3.7 Determine the best solution for BYOD and guest access
- 3.7.1 User provisioning
- 3.7.2 Captive portals
- 3.7.3 Device and software control solutions

Understand Organizational Goals (25%)

4.1 Understand issues in common vertical markets
- 4.1.1 Standard Enterprise Offices
- 4.1.2 Healthcare
- 4.1.3 Hospitality
- 4.1.4 Conference Centers
- 4.1.5 Education
- 4.1.6 Government
- 4.1.7 Retail
- 4.1.8 Industrial
- 4.1.9 Emergency Response
- 4.1.10 Temporary Deployments
- 4.1.11 Small Office/Home Office (SOHO)
- 4.1.12 Public Wi-Fi

4.2 Gather information about existing networks
- 4.2.1 Network diagrams

- 4.2.2 Wi-Fi implementations
- 4.2.3 Neighbor networks
- 4.2.4 Available network services
- 4.2.5 PoE availability

4.3 Discover coverage and capacity needs

- 4.3.1 Define coverage areas
- 4.3.2 Define capacity zones

4.4 Discover client devices and applications in use

- 4.4.1 Laptops, tablets, mobile phones, desktops, and specialty devices
- 4.4.2 Real-time applications
- 4.4.3 Standard applications (e-mail, web browsing, database access, etc.)
- 4.4.4 Data-intensive applications (file downloads/uploads, cloud storage, cloud backup, etc.)

4.5 Determine the need for outdoor coverage networks and bridge links

- 4.5.1 Bridge link distance and required throughput
- 4.5.2 Outdoor areas requiring coverage
- 4.5.3 Use cases for outdoor access

4.6 Define security constraints

- 4.6.1 Regulatory
- 4.6.2 Industry standards and guidelines
- 4.6.3 Organizational policies

4.7 Discover use cases and access types

- 4.7.1 Authorized users
- 4.7.2 Onboarded guest access
- 4.7.3 Public Wi-Fi

4.8 Match organizational goals to WLAN features and functions