

# NETLOGIC TRAINING CENTER

## Course Training

### Cisco Certificated Network Associated Wireless – CCNA Wireless (200-355 WIFUND) version 1.0

#### Course Content

Implementing Cisco Wireless Network Fundamentals course is designed for individuals who are involved in the technical management of Cisco wireless platforms and solutions, which involves installing, configuring, operating and troubleshooting.

#### Course Objective

Upon completion of the course, students will have the knowledge and skills to:

- Understand the basic RF principles and characteristics
- Understand WLAN security methods and access with differing client devices
- Define the Cisco WLAN architecture and the underlying infrastructure used to support it
- Implement a Centralized wireless access network using AireOS or IOS-XE wireless LAN controllers
- Implement a Converged wireless access network using IOS-XE converged access switches and wireless LAN controllers
- Implement small and remote access wireless networks using FlexConnect, Autonomous or Cloud architectures
- Perform basic WLAN maintenance and troubleshooting -describe the requirements for a WLAN design

#### Course Prerequisite

It is recommended, but not required, that students have the following knowledge and skills before attending this course:

- Interconnecting Cisco Networking Devices Parts 1 & 2 (ICND1 & ICND2) or
- Cisco CCENT certification

#### Course Pre-Test

Not Required

## Course Details

### Day 1

Item	Subject	Details	Personal Lab and devices	Workgroup Lab and devices
1	RF Fundamentals	<ul style="list-style-type: none"> <li>• Describe the propagation of radio waves               <ul style="list-style-type: none"> <li>a Frequency, amplitude, phase, wavelength (characteristics)</li> <li>b Absorption, reflection, diffraction, scattering, refraction, fading, free space path loss, multipath</li> </ul> </li> <li>• Interpret RF signal measurements               <ul style="list-style-type: none"> <li>a Signal strength (RSSI, Transmit power, receive sensitivity)</li> <li>b Differentiate interference vs. noise</li> <li>c Device capabilities (smartphones, laptops, tablets)</li> <li>d Define SNR</li> </ul> </li> <li>• Explain the principles of RF mathematics               <ul style="list-style-type: none"> <li>a Compute dBm, mW, Law of 3s and 10s,</li> </ul> </li> <li>• Describe Wi-Fi antenna characteristics               <ul style="list-style-type: none"> <li>a Ability to read a radiation pattern chart</li> <li>b Antenna types and uses</li> <li>c dBi, dBd, EIRP</li> </ul> </li> </ul>	Theory and Lecture	
<b>Break</b>				
2	802.11 Technology Fundamentals	<ul style="list-style-type: none"> <li>• Describe basic Wi-Fi governance               <ul style="list-style-type: none"> <li>a Describe regional regulatory bodies (such as, FCC / ETSI/ NTT)</li> <li>b IEEE 802.11</li> <li>c Wi-Fi Alliance</li> </ul> </li> <li>• Describe usable channel and power combination               <ul style="list-style-type: none"> <li>a Regional EIRP limitation examples</li> <li>b ISM, UNII frequency bands</li> <li>c Describe RRM fundamental(s)</li> </ul> </li> <li>• Describe 802.11 fundamentals               <ul style="list-style-type: none"> <li>a Modulation techniques</li> <li>b Channel width</li> <li>c MIMO / MU-MIMO                   <ul style="list-style-type: none"> <li>c (i) MRC</li> <li>c (ii) Beam forming</li> <li>c (iii) Spatial streams</li> </ul> </li> <li>d Wireless topologies                   <ul style="list-style-type: none"> <li>d (i) IBSS</li> <li>d (ii) BSS</li> <li>d (iii) ESS</li> </ul> </li> <li>e Frame types                   <ul style="list-style-type: none"> <li>e (i) Management</li> <li>e (ii) Control</li> <li>e (iii) Data</li> </ul> </li> </ul> </li> </ul>	Theory, Lecture and Calculated	
	Summary challenge advance lab for factory default and basic configure	(Lab 1) Factory Default Wireless LAN Controller  (Lab 2) Factory Default Access Point  (Lab 3) Basic configuration Wireless LAN Controller and NTP	(Lab 1, 2, and Lab 3)  <b>Real Device</b> Catalyst 3560 1 Unit Cisco Wireless Controller 2504 1 Unit Cisco Access Point 2700 1 unit	

## Day 2

Item	Subject	Details	Trainee Lab and devices	Workgroup Lab and devices
3	Implementing a Wireless Network	<ul style="list-style-type: none"> <li>• Describe the various Cisco wireless architectures               <ul style="list-style-type: none"> <li>a Cloud</li> <li>b Autonomous</li> <li>c Split MAC                   <ul style="list-style-type: none"> <li>c (i) FlexConnect</li> <li>c (ii) Centralized</li> <li>c (iii) Converged</li> </ul> </li> </ul> </li> <li>• Describe physical infrastructure connections               <ul style="list-style-type: none"> <li>a Wired infrastructures (AP, WLC, access/trunk ports, LAG)</li> </ul> </li> </ul>	Theory and Lecture	
<b>Break</b>				
		<ul style="list-style-type: none"> <li>• Describe AP and WLC management access connections               <ul style="list-style-type: none"> <li>a Management connections (Telnet, SSH, HTTP, HTTPS, console)</li> <li>b IP addressing: IPv4 / IPv6</li> <li>c Management via wireless</li> </ul> </li> </ul>	Theory and Lecture	
	Summary challenge advance lap for Wireless LAN Controller and access point provisioning	(Lab 1) Cisco Access Point Provisioning with Apple IOS and Android for 2.4 GHz and 5 GHz  (Lab 2) Verifying 2.4 GHz and 5 GHz operation via Wi-Fi analysis	(Lab 1 and Lab 2)  <u>Real Device</u> Catalyst 3560 1 Unit Cisco Wireless Controller 2504 1 Unit Cisco Access Point 2700 1 unit Cisco Air Provisioning Tool Wi-Fi analysis tool	

**Day 3**

Item	Subject	Details	Trainee Lab and devices	Workgroup Lab and devices
4	Operating a Wireless Network	<ul style="list-style-type: none"> <li>• Execute initial setup procedures Cisco wireless infrastructures               <ul style="list-style-type: none"> <li>a Cloud</li> <li>b Converged</li> <li>c Centralized</li> <li>d Autonomous</li> </ul> </li> <li>• Describe the Cisco implementation of the CAPWAP discovery and join process               <ul style="list-style-type: none"> <li>a DHCP</li> <li>b DNS</li> <li>c Master-controller</li> <li>d Primary-secondary-tertiary</li> </ul> </li> <li>• Distinguish different lightweight AP modes</li> </ul>	Theory and Lecture	
Break				
		4.4 Describe and configure the components of a wireless LAN access for client connectivity using GUI only 4.5 Identify wireless network and client management and configuration platform options 4.5.a Controller GUI and CLI 4.5.b Prime infrastructure 4.5.c Dashboard 4.5.d ISE 4.6 Maintain wireless network 4.6.a Perform controller configuration backups 4.6.b Perform code updates on controller, APs, and converged access switches 4.6.b (i) AireOS: boot loader (FUS), image 4.6.b (ii) IOS-XE: bundle, unbundle 4.6.b (iii) Autonomous	Theory and Lecture	
	Summary challenge advance lap for Wireless LAN Controller High Availability	Lab (1) - Configure and verifying Wireless LAN controller high available (WLC HA)  (Lab 2) - Checking ESXi and vCenter operation (pre-installation by Admin) - Checking VM Network cooperation with core switch (pre-installation by Admin) - Checking VM teaming integrated with Core switch (pre-installation by Admin)  (Lab 3) - Configure Link Aggregation for support VM and Wireless LAN Controller on Core switch - Basic configure switch feature for support Wireless Network	(Lab 2 and Lab 3)  <b>Real Device</b> Catalyst 3560 1 Unit Cisco Wireless Controller 2504 1 Unit Cisco Access Point 2700 1 unit	(Lab 1)  <b>Real Device</b> Catalyst 3560 1 Unit Cisco Wireless Controller 2504 1 Unit Cisco Access Point 2700 1 unit

## Day 4

Item	Subject	Details	Personal Lab and devices	Workgroup Lab and devices
5	Configuration of Client Connectivity	<ul style="list-style-type: none"> <li>Identify authentication mechanisms               <ul style="list-style-type: none"> <li>a LDAP, RADIUS, local authentication, WebAuth, 802.1X, PSK</li> </ul> </li> <li>Configuring WLAN authentication mechanisms on the controller               <ul style="list-style-type: none"> <li>a WebAuth, 802.1X, PSK</li> <li>b TKIP deprecation</li> </ul> </li> <li>Configure client connectivity in different operating systems               <ul style="list-style-type: none"> <li>a Android, MacOS, iOS, Windows</li> </ul> </li> </ul>	Theory and Lecture	
<b>Break</b>				
		<ul style="list-style-type: none"> <li>Describe roaming               <ul style="list-style-type: none"> <li>a Layer 2 and Layer 3</li> <li>b Intracontroller and intercontroller</li> <li>c Centralized mobility</li> <li>d Converged mobility</li> </ul> </li> <li>Describe wireless guest networking               <ul style="list-style-type: none"> <li>a Anchor controller</li> <li>b Foreign controller</li> </ul> </li> </ul>	Theory and Lecture	
	Summary challenge advance lab for Wireless Single Sign-On with Microsoft AD	(Lab 4) (Continouse) - Checking Domain Controller operation ((pre-installation by Admin) - Configure Guest VLAN - Install Certificated Authority server (CA) - verify certificated on client and AD - Install Radius server and configuration - Verify Radius operation with AD and CA - Configure DHCP server on Guest  (Lab 5) - Configure Wireless LAN Controller operation with Radius - Configure Wireless LAN Controller for Single-Sign-On (SSO) - Verify client SSO and operation - Verify 2.4 GHz and 5 GHz signaling and operation	(Lab 4 and Lab 5 )  <b>Real Device</b> Catalyst 3560 1 Unit Cisco Wireless Controller 2504 1 Unit Cisco Access Point 2700 1 unit VMWare ESXi vCenter vSphere	

**Day 5**

Item	Subject	Details	Personal Lab and devices	Workgroup Lab and devices
6	Performing Client Connectivity Troubleshooting	<ul style="list-style-type: none"> <li>Validating WLAN configuration settings at the infrastructure side               <ul style="list-style-type: none"> <li>a Security settings</li> <li>b SSID settings</li> </ul> </li> <li>Validating AP infrastructure settings               <ul style="list-style-type: none"> <li>a Port level configuration</li> <li>b Power source</li> <li>c AP and antenna orientation and position</li> </ul> </li> <li>Validate client settings               <ul style="list-style-type: none"> <li>a SSID</li> <li>b Security</li> <li>c Device driver version</li> </ul> </li> <li>Employ appropriate controller tools to assist troubleshooting               <ul style="list-style-type: none"> <li>a GUI logs</li> <li>b CLI show commands</li> <li>c Monitor pages                   <ul style="list-style-type: none"> <li>(i) CleanAir (controller GUI)</li> </ul> </li> </ul> </li> <li>Identify appropriate third-party tools to assist troubleshooting               <ul style="list-style-type: none"> <li>a OS-based Client utilities</li> <li>b Wi-Fi scanners</li> <li>c RF mapping tool</li> </ul> </li> </ul>	Theory and Lecture	
<b>Break</b>				
7	Site Survey Process	<ul style="list-style-type: none"> <li>Describe site survey methodologies and their purpose               <ul style="list-style-type: none"> <li>a Offsite (predictive / plan)</li> <li>b Onsite                   <ul style="list-style-type: none"> <li>(i) Predeployment (AP on a stick)</li> <li>(ii) Post deployment (validation)</li> </ul> </li> </ul> </li> <li>Describe passive and active site surveys</li> <li>Identify proper application of site survey tools               <ul style="list-style-type: none"> <li>a Spectrum analyzer</li> <li>b Site surveying software</li> </ul> </li> <li>Describe the requirements of client real-time and non-real-time applications</li> </ul>	Theory and Lecture	
	Summary challenge advance lab for Wireless LAN Site Survey and Report tool	(Lab 1) - Configure Cisco Site Survey tool on Wireless LAN Controller - Verify Site Survey and Resource and Design Wireless following Site Survey	(Lab 1) <b>Real Device</b> Catalyst 3560 1 Unit Cisco Wireless Controller 2504 1 Unit Cisco Access Point 2700 1 unit	

**Course Post-Test**

Not Required

**Course Materials**

Not include in this class training (but you can requested from sale team)

**Course Devices Training (Per 1 Person)**



**Cisco Access Point 2700**



**Cisco Wireless LAN Controller 2504**



**Cisco Catalyst 3560-CX**



**Cisco Server UCS - C series**

