

# **Wireless Connectivity: Secure Practices and Troubleshooting**

## **Module 1: Foundations of Wireless Networking**

**Evolution of Wireless Communication**

**Electromagnetic Spectrum and Frequency Bands**

**Modulation Techniques and Applications**

**Signal Propagation and Path Loss**

## **Module 2: RF Fundamentals and Behavior**

**RF Behavior and Characteristics**

**Multipath Propagation Effects**

**Antennas and RF Mathematics**

**Antenna Polarization Diversity**

## **Module 3: Securing Wireless Networks**

**Wireless Threat Analysis**

**Rogue AP Detection and Mitigation**

**Encryption Protocols: WPA/WPA2, WEP, WPA3**

**Strong Authentication: EAP-TLS**

## **Module 4: Robust Wireless Security Strategies**

**Encryption Algorithms: AES, TKIP**

**WPA3 Enhancements and Benefits**

**RADIUS Server and 802.1X Authentication**

**Comprehensive Wireless Security Policy**

## **Module 5: RF Signal Measurements and Analysis**

**RF Signal Measurements and Spectrum Analysis**

**Signal-to-Noise Ratio (SNR) Measurements**

**Channel Utilization Analysis**

## **Identifying and Locating Interference**

### **Module 6: WLAN Frame Types and Concepts**

#### **802.11 Frame Types**

##### **Beacon, Probe, Authentication Frames**

##### **Deauthentication and Disassociation Frames**

##### **QoS Data and Management Frames**

### **Module 7: WLAN Security and Authentication**

#### **WLAN Security and Authentication**

##### **AAA Server Integration: RADIUS, TACACS+**

##### **Captive Portal Authentication**

##### **Guest Network Provisioning**

### **Module 8: WLAN Troubleshooting and Management**

#### **WLAN Troubleshooting Methodology**

##### **Identifying and Isolating Issues**

##### **Troubleshooting Client Connectivity**

##### **Troubleshooting Tools and Logs**