Here's a **detailed table of contents (TOC)** for a training program on **Wireless Networks, OpenWiFi, Mesh Networking, and ACS (Auto Configuration Server)**:

Module 1: Introduction to Wireless Networking

1. **Basics of Wireless Networking**
    - Understanding Wireless Communication: RF Signals, Frequency Bands
    - Types of Wireless Networks: Wi-Fi, Cellular, Bluetooth, Zigbee
    - Key Components: Routers, Access Points, Clients
    - Wireless Standards: IEEE 802.11, Wi-Fi 4, 5, 6, and Wi-Fi 6E
2. **Wireless Networking Protocols**
    - Wi-Fi Protocols and Frequencies: 2.4 GHz vs. 5 GHz
    - Introduction to OFDM (Orthogonal Frequency Division Multiplexing)
    - Understanding Channelization and Bandwidth Allocation
3. **Wireless Network Design Principles**
    - Planning Coverage Areas and Capacity Requirements
    - Interference and Signal Propagation
    - Site Survey Tools and Techniques
    - Optimizing Network Performance

Module 2: Overview of OpenWiFi

1. **Introduction to OpenWiFi**
    - What is OpenWiFi?
    - Benefits of OpenWiFi for Public and Private Networks
    - OpenWiFi Architecture and Key Components
    - OpenWiFi vs Traditional Proprietary Wi-Fi Solutions
2. **OpenWiFi Components and Deployment**
    - OpenWiFi Architecture: Controller, Access Points, and Clients
    - Deployment Considerations for OpenWiFi
    - Configuring Access Points with OpenWiFi
    - Managing OpenWiFi Networks through Controllers
3. **OpenWiFi Software and Platforms**

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- Popular OpenWiFi Platforms: OpenWrt, OpenMesh
- Installing and Configuring OpenWiFi Software
- Key Features and Customizations in OpenWiFi

Module 3: Mesh Networking Fundamentals

1. **What is Mesh Networking?**
    - Definition and Key Concepts of Mesh Networks
    - Benefits of Mesh Networks in Wireless Communication
    - Mesh Networking Topologies: Full Mesh, Partial Mesh
    - Differences Between Mesh and Traditional Point-to-Point Networks
2. **How Mesh Networking Works**
    - Data Forwarding in Mesh Networks: Routing and Handoff
    - Self-Healing and Scalability of Mesh Networks
    - Role of Nodes, Routers, and End Devices in a Mesh Network
    - Mesh Network Protocols: IEEE 802.11s and others
3. **Designing and Deploying Mesh Networks**
    - Planning a Mesh Network: Site Survey and Placement
    - Configuring Nodes for Mesh Networking
    - Performance Optimization: Channel Selection and Interference Management
    - Troubleshooting and Monitoring Mesh Networks

Module 4: Advanced Mesh Networking Concepts

1. **Advanced Mesh Routing Protocols**
    - Understanding AODV (Ad hoc On-demand Distance Vector)
    - OLSR (Optimized Link State Routing) in Mesh Networks
    - Comparing Routing Protocols for Mesh Networking
2. **Security in Mesh Networks**
    - Ensuring Secure Communication in Mesh Networks
    - Encryption Techniques and Secure Mesh Routing
    - Preventing Interference and Eavesdropping in Mesh Networks
    - Best Practices for Mesh Network Security

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3. **Mesh Network Optimization**
    - Optimizing Coverage and Throughput in Mesh Networks
    - Reducing Latency and Enhancing QoS (Quality of Service)
    - Scalability Challenges and Solutions in Large-Scale Mesh Deployments

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Module 5: Auto Configuration Server (ACS) in Wireless Networks

1. **What is ACS?**
    - Introduction to Auto Configuration Servers (ACS)
    - Role of ACS in Remote Configuration and Management of Network Devices
    - ACS in Broadband Networks: TR-069 Protocol
    - Benefits of ACS in Managing Large-Scale Networks
2. **Setting Up and Configuring ACS**
    - Installing and Configuring ACS Servers
    - Integrating ACS with Wireless Access Points and Mesh Nodes
    - Remote Device Management via ACS
    - Configuration and Firmware Updates via ACS
3. **ACS in OpenWiFi and Mesh Networks**
    - Role of ACS in OpenWiFi Deployments
    - Managing Mesh Network Nodes with ACS
    - Automation of Network Configuration and Updates

Module 6: Performance Monitoring and Troubleshooting

1. **Monitoring Wireless and Mesh Networks**
    - Key Metrics for Wireless Network Performance
    - Tools and Techniques for Monitoring Wi-Fi and Mesh Networks
    - Monitoring OpenWiFi Networks with Controllers
2. **Troubleshooting Wireless Network Issues**
    - Common Issues in Wireless Networks: Interference, Channel Overlap, etc.
    - Tools for Troubleshooting: Wi-Fi Analyzers, Spectrum Analyzers
    - Solving Connectivity and Performance Issues in Mesh Networks
3. **Troubleshooting ACS Issues**

- Common ACS-related Problems and Solutions
- Ensuring Reliable Communication Between ACS and Devices
- Debugging Configuration Errors and Firmware Issues

Module 7: Best Practices for Wireless, OpenWiFi, and Mesh Networks

1. **Design Best Practices**
   - Planning Coverage and Bandwidth Allocation in Large Networks
   - Implementing Redundancy and Failover for Network Reliability
   - Optimizing OpenWiFi and Mesh Networks for High Density
2. **Deployment Best Practices**
   - Ensuring Seamless Integration of OpenWiFi and Mesh with Existing Infrastructure
   - Scalability Considerations for Growing Networks
   - Managing Multi-SSID Configurations in OpenWiFi
3. **Security and Compliance Best Practices**
   - Implementing WPA3 and Enhanced Security Protocols in Wireless Networks
   - Regulatory Compliance: GDPR, HIPAA, etc. for Wireless Networks
   - Securing OpenWiFi and Mesh Networks Against External Threats

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Module 8: Real-World Applications and Case Studies

1. **Case Study 1: Deploying OpenWiFi for Public Access Networks**
   - Challenges and Solutions in Public Wi-Fi Deployments
   - Implementing OpenWiFi for Smart Cities or Campuses
2. **Case Study 2: Scaling Mesh Networks in Large Environments**
   - Mesh Network Deployment in Smart Homes, Enterprises, and Campuses
   - Real-World Examples of Mesh Networks in Action
3. **Case Study 3: Integrating ACS for Remote Device Management**
   - Leveraging ACS for Large-Scale Wireless Network Management
   - Automated Firmware Updates and Configuration in Mesh Deployments

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Module 9: Hands-On Projects and Capstone

1. **Project 1: Setting Up a Simple Wireless Mesh Network**

2. **Project 2: Deploying OpenWiFi on Multiple Access Points**
3. **Project 3: Configuring and Managing Devices Using ACS**
4. **Capstone Project: Designing, Deploying, and Managing a Complete Wireless Mesh Network with OpenWiFi and ACS**

Module 10: Closing and Certification

1. **Final Assessment and Certification**
2. **Q&A and Career Guidance**
3. **Further Learning Resources and Next Steps in Wireless Networking**