

# **COURSE OUTLINE**

## **CSCO-653**

### **Maintaining and Troubleshooting IP Networks**

**3 Credits**

## **HOWARD COMMUNITY COLLEGE**

### **Description**

This course teaches students how to monitor and maintain complex, enterprise routed and switched IP networks. Skills learned include the planning and execution of regular network maintenance, as well as supporting and troubleshooting using technology-based processes and best practices, based on systematic and industry recognized approaches. Extensive labs emphasize hands-on learning and practice to reinforce troubleshooting techniques. This course prepares students to take the TSHOOT 642-832 certification exam. Prerequisites: CSCO-651 and CSCO-652. (2 hours lecture, 3 hours lab)

### **Overall Course Objectives**

Upon completion of this course, the student will be able to:

1. Plan and document the most common maintenance function in complex enterprise networks.
2. Evaluate commonly-practiced models and methodologies for network maintenance.
3. Identify, evaluate, and select tools, applications, and resources to support network maintenance processes.
4. Plan and implement troubleshooting procedures as part of a structured troubleshooting methodology.
5. Select tools that best support specific troubleshooting and maintenance processes in large, complex enterprise networks.
6. Diagnose VLAN, VTP, and trunking problems using the IOS command line interface.
7. Diagnose spanning tree problems and problems with SVIs and inter-VLAN routing.
8. Diagnose and resolve problems related to first hop redundancy protocols such as HSRP, VRRP, and GLBP.
9. Diagnose and resolve problems in EIGRP, OSPF and BGP routing protocols and redistribution.
10. Understand common issues related to NAT/PAT and DHCP.
11. Identify common IPv6 routing and tunneling issues.
12. Diagnose performance problems on Catalyst switches and routers.
13. Identify common issues when integrating wireless capabilities into a network.
14. Identify common issues when integrating voice and video into a network.
15. Practice maintenance procedures and fault resolution in a secure infrastructure.
16. Describe security features commonly implemented in complex networks and explain how those features affect the troubleshooting process.
17. Describe issues related to branch office and remote worker implementations.
18. Diagnose and resolve problems in integrated, complex enterprise networks.

### **Major Topics**

- I. Planning Maintenance for Complex Networks  
Maintenance Methodologies  
Maintenance Processes and Procedures  
Network Maintenance Tools, Applications, and Resources

- II. Troubleshooting Processes for Complex Enterprise Networks
  - Troubleshooting Methodologies
  - Implementing Troubleshooting Procedures
  - Integrating Troubleshooting into the Network Maintenance Process
- III. Using Maintenance and Troubleshooting Tools and Applications
  - Using Cisco IOS Software for Maintenance and Troubleshooting
  - Using Specialized Maintenance Troubleshooting Tools
- IV. Maintaining and Troubleshooting Campus Switched Solutions
  - Troubleshooting VLANs, Spanning Tree
  - Troubleshooting Switched Virtual Interfaces (SVIs) and Inter-VLAN Routing
  - Troubleshooting First Hop Redundancy Protocol Operation
- V. Maintaining and Troubleshooting Routing Solutions
  - Troubleshooting Network Layer Connectivity
  - Troubleshooting EIGRP, OSPF and BGP and redistribution
- VI. Troubleshooting Addressing Services
  - Identifying Common IPv4 and IPv6 Addressing Service Issues and Tunneling Issues
- VII. Troubleshooting Network Performance
  - Troubleshooting Performance Issues on Switches and Routers
- VIII. Troubleshooting Converged Networks
  - Wireless Issues and Unified Communications
- IX. Maintaining and Troubleshooting Network Security Implementations
  - Secure Networks
  - Management Plan Security
  - Data Plane Security
  - Branch office and Remote Worker Connectivity
- X. Troubleshooting Complex Environments

### **Course Requirements**

**Grading/exams:** Grading procedures will be determined by the individual faculty member but will include the following: Final grades will be based primarily on homework, lab exercises, lab practical and final exam.

### **Other Course Information**

This course is a course in the Computer Support Technology program. This course is also intended for students who wish to become a Cisco Certified Network Professional (CCNP).