

I. COURSE INFORMATION

- A. Computer Science 250 Cisco Routing and Switching Essentials
- B. 3 credit hours
- C. Online textbook: <https://www.netacad.com/home>
- D. Prerequisites: CIS 125 Cisco Network Basics

II. COURSE DESCRIPTION

This course describes the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality, and troubleshoot common issues with RIPv1, RIPv2, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks.

III. LEARNING OUTCOMES

- A. Understand and describe basic switching concepts and the operation of Cisco switches.
- B. Configure, and troubleshoot Cisco IOS® devices for Internet and server connectivity.
- C. Understand and describe enhanced switching technologies such as VLANs, VLAN Trunking Protocol (VTP), Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Protocol (PVSTP), and 802.1q
- D. Configure and troubleshoot basic operations of a small switched network.
- E. Understand and describe the purpose, nature, and operations of a router, routing tables, and the route lookup process.
- F. Configure and verify static routing and default routing.
- G. Understand and describe how VLANs create logically separate networks and how routing occurs between them.
- H. Understand and describe dynamic routing protocols, distance vector routing protocols, and link-state routing protocols.
- I. Configure and troubleshoot basic operations of routers in a small routed network.
- J. Understand and describe the purpose and types of access control lists (ACLs).
- K. Understand and describe the operations and benefits of Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) for IPv4 and IPv6.
- L. Understand and describe the operations and benefits of Network Address Translation (NAT).

IV. MAJOR CONTENT AREAS

- A. LAN Switching
- B. Routing Between Networks
- C. Enable Static Routing
- D. Implementing VLANs
- E. Inter-VLAN Communication
- F. Implementing Dynamic Routing
- G. Access Control Lists
- H. IP Services

I. ASSIGNMENTS (may include but are not limited to)

- A. Chapter and final exams
- B. Lab assignments
- C. Packet Tracer assignments
- D. Capstone project
- E. Final lab skills exam

II. EVALUATION METHODS (may include but are not limited to)

- A. Written objective and/or subjective exams
- B. Practical laboratory assignments and exams
- C. Class projects