



NETWORK SYSTEMS II: ROUTING AND SWITCHING ESSENTIALS — ISTC 2006

A. Course Description

- **Credits:** 3.00
- **Lecture Hours/Week:** 2.00
- **Lab Hours/Week:** 1.00
- **OJT Hours/Week:** 0
- **Prerequisites:**
 - ISTC 1045: Network Systems I: Introduction to Networking
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 - ISTC 1045: Network Systems I: Introduction to Networking
- **Corequisites:** None
- **MnTC Goals:** None

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. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPv2, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks. This is the second course preparing the student to take the Cisco Certified Network Associate (CCNA) Routing and Switching examination. Prerequisite: ISTC1045

B. **Course Effective Dates:** 8/24/14 – Present

C. Outline of Major Content Areas

As noted on course syllabus

D. Learning Outcomes

1. Configure and troubleshoot basic operations of a small switched network including VLANs and inter-VLAN routing
2. Configure and troubleshoot basic operations of routers in a small routed network: - Static routing and default routing - Routing Information Protocol (RIPv1 and RIPv2) - Open Shortest Path First (OSPF) protocol (single-area OSPF)
3. Configure, monitor, and troubleshoot ACLs for IPv4 and IPv6 and NAT operations
4. Understand and describe basic switching concepts and the operation of Cisco switches

5. 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
6. Understand and describe how VLANs create logically separated networks and how routing occurs between them
7. Understand and describe the operations and benefits of Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) for IPv4 and IPv6
8. Understand and describe the operations and benefits of Network Address Translation (NAT)
9. Understand and describe the purpose and types of access control lists (ACLs)
10. Understand and describe the purpose, nature, and operations of a router, routing tables, the route lookup process, dynamic routing protocols, distance vector routing protocols, and link-state routing protocols

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

F. Learner Outcomes Assessment

As noted on course syllabus

G. Special Information

None noted