Course Title - Routing and Switching Essentials (CISCO 2)
Course Prefix and Number – ITCC 1476
Department – Computer Science
Division – Technology & Business
Course Type: (check one)
☐ Academic General Education Course (from ACGM – but not in WCJC Core)
☐ Academic WCJC Core Course
☒ WECM course (This course is a Special Topics or Unique Needs Course: Y ☒ or N ☐)

Semester Credit Hours #: Lecture Hours #: Lab/Other Hours #:  4:3:3
Equated Pay hours for course – 4.5

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.

Typically offered spring semester

Prerequisites/Co-requisites – C or better in ITCC 1475

Prepared by: Donna Schilling    Date: 07-19-2015
Reviewed by Department Head: Donna Schilling    Date: 07-19-2015
Accuracy verified by Division Chair: David Kucera    Date: 8/12/15
Approved by Dean or Vice President of Instruction: Leigh Ann Collins    Date: 3-4-16
I. Topical Outline – Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, clinical or other non-lecture instruction):

- Introduction to Switched Networks
- Basic Switching Concepts and Configuration
- Implementing VLAN Security
- Routing Concepts
- Inter-VLAN Routing
- Static Routing
- Routing Dynamically
- Single-Area OSPF
- Access Control Lists
- DHCP
- Network Address Translation for IPv4

II. Course Learning Outcomes

<table>
<thead>
<tr>
<th>Learning Outcomes</th>
<th>Methods of Assessment</th>
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<tbody>
<tr>
<td>Upon successful completion of this course, students will:</td>
<td>All outcomes will be assessed by one or more of the following:</td>
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<tr>
<td>1. Understand and describe basic switching concepts and the operation of Cisco switches.</td>
<td>Individual Projects</td>
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<td>2. 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.</td>
<td>Tests and Quizzes</td>
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<tr>
<td>3. Configure and troubleshoot basic operations of a small switched network.</td>
<td>Lab Assignments</td>
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<td>4. Understand and describe the purpose, nature, and operations of a router, routing tables, and the route lookup process.</td>
<td>Final Exam</td>
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<td>5. Understand and describe how VLANs create logically separate networks and how routing occurs between them.</td>
<td>Skills Exam</td>
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<tr>
<td>6. Configure and troubleshoot basic operations of routers in a small routed network: A. Routing Information Protocol (RIPv1 and RIPv2) B. Open Shortest Path First (OSPF) protocol (single-area OSPF)</td>
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<td>7. Configure and troubleshoot VLANs and inter-VLAN routing.</td>
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<td>8. Understand and describe the purpose and types of access control lists (ACLs).</td>
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<td>10. Understand and describe the operations and benefits of Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) for IPv4 and IPv6.</td>
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<tr>
<td>11. Understand and describe the operations and benefits of</td>
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Network Address Translation (NAT).
12. Configure and troubleshoot NAT operations.
13. Configure and verify static routing and default routing.

III. Required Text(s), Optional Text(s) and/or Materials to be Supplied by Student.

- USB Flash Drive
- High-speed Internet Connection

IV. Suggested Course Maximum - 18

V. List any specific spatial or physical requirements beyond a typical classroom required to teach the course.
Computer for each student, Cisco routers, switches, wireless routers, fiber cable tester, Ethernet cable testers

VI. Course Requirements/Grading System – Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course

<table>
<thead>
<tr>
<th>Course Requirements</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Comprehensive Skills Exam</td>
<td>20-25%</td>
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<tr>
<td>Comprehensive Final Exam</td>
<td>20-25%</td>
</tr>
<tr>
<td>Labs/Homework</td>
<td>25-30%</td>
</tr>
<tr>
<td>Chapter Tests</td>
<td>20-25%</td>
</tr>
<tr>
<td>Attendance/Participation</td>
<td>0-15%</td>
</tr>
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Grading System –

100 -90 = A 
89 - 80 = B 
79 - 70 = C 
69 - 60 = D 
and below = F

VII. Curriculum Checklist

☐ - Academic General Education Course (from ACGM – but not in WCJC Core)
No additional documentation needed

☐ - Academic WCJC Core Course
Attach the Core Curriculum Checklist, including the following:
- Basic Intellectual Competencies
- Perspectives
- Exemplary Educational Objectives

☑ - WECM Courses
If needed, revise the Program SCANS Matrix & Competencies Checklist.