



**Course Information**

<b>Course Title</b>	Routing and Switching Essentials (CISCO 2)
<b>Course Prefix, Num. and Title</b>	ITCC 1476 - Routing and Switching Essentials (CISCO 2)
<b>Division</b>	Technology & Business
<b>Department</b>	Computer Science
<b>Course Type</b>	WECM Course
<b>Course Catalog Description</b>	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
<b>Pre-Requisites</b>	C or better in ITCC 1475
<b>Co-Requisites</b>	None

**Semester Credit Hours**

<b>Total Semester Credit Hours (SCH): Lecture Hours:</b>	4:3:3
<b>Lab/Other Hours</b>	
<b>Equated Pay Hours</b>	4.5
<b>Lab/Other Hours Breakdown: Lab Hours</b>	3
<b>Lab/Other Hours Breakdown: Clinical Hours</b>	0
<b>Lab/Other Hours Breakdown: Practicum Hours</b>	0
<b>Other Hours Breakdown</b>	0

**Approval Signatures**

<b>Title</b>	<b>Signature</b>	<b>Date</b>
<b>Prepared by:</b>		
<b>Department Head:</b>		
<b>Division Chair:</b>		
<b>Dean/VPI:</b>		
<b>Approved by CIR:</b>		

## Additional Course Information

**Topical Outline:** Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, and 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

### Course Learning Outcomes:

#### Learning Outcomes – Upon successful completion of this course, students will:

1. Understand and describe basic switching concepts and the operation of Cisco switches.
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.
3. Configure and troubleshoot basic operations of a small switched network.
4. Understand and describe the purpose, nature, and operations of a router, routing tables, and the route lookup process.
5. Understand and describe how VLANs create logically separate networks and how routing occurs between them.
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)
7. Configure and troubleshoot VLANs and inter-VLAN routing.
8. Understand and describe the purpose and types of access control lists (ACLs).
9. Configure, monitor, and troubleshoot ACLs for IPv4 and IPv6.
10. Understand and describe the operations and benefits of Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) for IPv4 and IPv6.
11. Understand and describe the operations and benefits of Network Address Translation (NAT).
12. Configure and troubleshoot NAT operations.
13. Configure and verify static routing and default routing.

#### Methods of Assessment:

All outcomes will be assessed by one or more of the following:

Individual Projects  
Tests and Quizzes  
Lab Assignments  
Final Exam  
Skills Exam

### Required text(s), optional text(s) and/or materials to be supplied by the student:

- CCNA Portable Command Guide Third Edition by Empson ISBN-9781587204302 eBook: 9780133381368
- USB Flash Drive
- High-speed Internet Connection

## Suggested Course Maximum:

18

## List any specific 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

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

Course Requirements:

Comprehensive Skills Exam: 20-25%

Comprehensive Final Exam: 20-25%

Labs / Homework: 25-30%

Chapter Tests: 20-25%

Attendance / Participation: 0-15%

Grading System:

100-90 = A

89-80 = B

79-70 = C

69-60 = D

and below = F

## Curriculum Checklist:

- Administrative General Education Course** (from ACGM, but not in WCJC Core) – No additional documents needed.
- Administrative WCJC Core Course.** Attach the Core Curriculum Review Forms
  - Critical Thinking
  - Communication
  - Empirical & Quantitative Skills
  - Teamwork
  - Social Responsibility
  - Personal Responsibility
- WECM Course** -If needed, revise the Program SCANS Matrix and Competencies Checklist