

Washtenaw Community College Comprehensive Report

CNT 216 Switching, Routing and Wireless Essentials Effective Term: Winter 2021

Course Cover

Division: Business and Computer Technologies
Department: Computer Science & Information Technology
Discipline: Computer Networking Technology
Course Number: 216
Org Number: 13400
Full Course Title: Switching, Routing and Wireless Essentials
Transcript Title: Switching & Routing Essentials
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Course Change
Change Information:

Consultation with all departments affected by this course is required.

Course title

Course description

Outcomes/Assessment

Objectives/Evaluation

Rationale: The Cisco Networking Academy has updated the entire program. We must update our program and syllabi to match theirs in order to maintain our contract and remain an official Networking Academy. The program has been updated in consultation with Cisco's many channel partner companies.

Proposed Start Semester: Fall 2020

Course Description: The second course in the CISCO Certified Network Associate (CCNA) curriculum focuses on switching technologies and router operations that support small-to-medium business networks and includes wireless local area networks (WLANs) and security concepts. Students learn key switching and routing concepts. They can perform basic network configuration and troubleshooting, identify and mitigate local area network (LAN) security threats, and configure and secure a basic WLAN. This course is part of the CISCO networking curriculum at WCC and helps students prepare for a portion of the CCNA certification examination. The title of this course was previously Routing and Switching Essentials.

Course Credit Hours

Variable hours: No

Credits: 4

Lecture Hours: Instructor: 60 **Student:** 60

Lab: Instructor: 0 **Student:** 0

Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 60 **Student:** 60

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Level 2

Requisites

Prerequisite

CNT 206 minimum grade "C-"; may enroll concurrently

General Education

Degree Attributes

High School articulation approved

General Education Area 7 - Computer and Information Literacy

Assoc in Arts - Comp Lit

Assoc in Applied Sci - Comp Lit

Assoc in Science - Comp Lit

Request Course Transfer

Proposed For:

Eastern Michigan University

Student Learning Outcomes

1. Identify correct statements pertaining to switching and routing concepts, and perform switch and router configuration.

Assessment 1

Assessment Tool: Outcome-related questions on the Cisco final exam

Assessment Date: Winter 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of students must score 70% or higher on the outcome-related questions.

Who will score and analyze the data: Departmental faculty and external sources (if available)

Assessment 2

Assessment Tool: Outcome-related questions/tasks on the Cisco skills-based final exam

Assessment Date: Winter 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Cisco-provided rubric

Standard of success to be used for this assessment: 70% of students must score 70% or higher on the outcome-related questions.

Who will score and analyze the data: Departmental faculty

2. Identify correct statements pertaining to Virtual Local Area Networks (VLANs), and configure VLANs and routing between VLANs.

Assessment 1

Assessment Tool: Outcome-related questions/tasks on the Cisco skills-based final exam

Assessment Date: Winter 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Cisco-provided rubric

Standard of success to be used for this assessment: 70% of students must score 70% or higher on the outcome-related questions.

Who will score and analyze the data: Departmental faculty

Assessment 2

Assessment Tool: Outcome-related questions on the Cisco final exam

Assessment Date: Winter 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of students must score 70% or higher on the outcome-related questions.

Who will score and analyze the data: Departmental faculty and external sources (if available)

3. Identify correct statements pertaining to, and configure Dynamic Host Configuration Protocol (DHCP).

Assessment 1

Assessment Tool: Outcome-related questions/tasks on the Cisco skills-based final exam

Assessment Date: Winter 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Cisco-provided rubric

Standard of success to be used for this assessment: 70% of students must score 70% or higher on the outcome-related questions.

Who will score and analyze the data: Departmental faculty

Assessment 2

Assessment Tool: Outcome-related questions on the Cisco final exam

Assessment Date: Winter 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of students must score 70% or higher on the outcome-related questions.

Who will score and analyze the data: Departmental faculty and external sources (if available)

4. Identify correct statements pertaining to Wireless Local Area Networks (WLANs), and configure WLANs.

Assessment 1

Assessment Tool: Outcome-related questions/tasks on the Cisco skills-based final exam

Assessment Date: Winter 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Cisco-provided rubric

Standard of success to be used for this assessment: 70% of students must score 70% or higher on the outcome-related questions.

Who will score and analyze the data: Departmental faculty

Assessment 2

Assessment Tool: Outcome-related questions on the Cisco final exam

Assessment Date: Winter 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of students must score 70% or higher on the outcome-related questions.

Who will score and analyze the data: Departmental faculty and external sources (if available)

Course Objectives

1. Configure a router to route between multiple directly-connected networks.
2. Configure and troubleshoot static routes.
3. Determine the route source, administrative distance, and metric for a given route.
4. Configure basic switch settings to meet network requirements.
5. Configure a switch using security best practices in a small to medium-sized business network.
6. Implement VLANs to segment a small to medium sized business network.
7. Configure routing between VLANs in a small to medium-sized business network.
8. Implement DHCPv4 to operate across multiple LANs in a small to medium-sized business network.
9. Implement DHCPv6 to operate across multiple LANs in a small to medium-sized business network.
10. Configure and troubleshoot EtherChannel on switched links.
11. Implement a Wireless Local Area Network (WLAN).

New Resources for Course

Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

Level III classroom
Other: Internetworking/Security Lab

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>John Trame</i>	<i>Faculty Preparer</i>	<i>Apr 09, 2020</i>
Department Chair/Area Director: <i>Cyndi Millns</i>	<i>Recommend Approval</i>	<i>Apr 10, 2020</i>
Dean: <i>Eva Samulski</i>	<i>Recommend Approval</i>	<i>Apr 14, 2020</i>
Curriculum Committee Chair: <i>Lisa Veasey</i>	<i>Recommend Approval</i>	<i>Jun 15, 2020</i>
Assessment Committee Chair: <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Jul 14, 2020</i>
Vice President for Instruction: <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Jul 16, 2020</i>

Washtenaw Community College Comprehensive Report

CNT 216 Routing and Switching Essentials

Effective Term: Fall 2018

Course Cover

Division: Business and Computer Technologies

Department: Computer Instruction

Discipline: Computer Networking Technology

Course Number: 216

Org Number: 13400

Full Course Title: Routing and Switching Essentials

Transcript Title: Routing & Switching Essentials

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Time Schedule , Web Page

Reason for Submission: Course Change

Change Information:

Course description

Outcomes/Assessment

Objectives/Evaluation

Other:

Rationale: This course needs to be change to bring the outcomes and objectives in line with the recently released version 6.0 of the official Cisco Networking Academy.

Proposed Start Semester: Fall 2018

Course Description: In this course, students will study 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 virtual LANs and inter-VLAN routing in both IPv4 and IPv6 networks. This course is part of the CISCO networking curriculum at WCC and helps students prepare for a portion of the CISCO Certified Network Associate (CCNA) certification examination. This course was previously CNT 225. The title of this course was previously Internetworking II-Routers.

Course Credit Hours

Variable hours: No

Credits: 4

Lecture Hours: Instructor: 60 **Student:** 60

Lab: Instructor: 0 **Student:** 0

Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 60 **Student:** 60

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Level 2

Requisites

Prerequisite

CNT 206 minimum grade "C-"; may enroll concurrently

General Education

Degree Attributes

High School articulation approved

General Education Area 7 - Computer and Information Literacy

Assoc in Arts - Comp Lit

Assoc in Applied Sci - Comp Lit

Assoc in Science - Comp Lit

Request Course Transfer

Proposed For:

Eastern Michigan University

Student Learning Outcomes

1. Identify correct statements pertaining to basic switching concepts, and perform basic switch configuration.

Assessment 1

Assessment Tool: CISCO Academy-provided concepts and skills exams

Assessment Date: Winter 2018

Assessment Cycle: Every Three Years

Course section(s)/other population: Random sample of a minimum of three sections over the three-year period

Number students to be assessed: All students

How the assessment will be scored: The concepts exam is scored by CISCO. The skills exam is scored by WCC faculty, using the CISCO-provided rubric.

Standard of success to be used for this assessment: At least 70% of students must score 70% or higher on the outcome related questions.

Who will score and analyze the data: Department Faculty and external sources (if available)

2. Identify correct statements pertaining to the basic function of routers, and perform basic router configuration.

Assessment 1

Assessment Tool: CISCO Academy-provided concepts and skills exams

Assessment Date: Winter 2018

Assessment Cycle: Every Three Years

Course section(s)/other population: Random sample of a minimum of three sections over the three-year period

Number students to be assessed: All students

How the assessment will be scored: The concepts exam is scored by CISCO. The skills exam is scored by WCC faculty, in accordance with CISCO guidelines.

Standard of success to be used for this assessment: At least 70% of students must score 70% or higher on the outcome related questions.

Who will score and analyze the data: Department Faculty and external sources (if available)

3. Identify correct statements pertaining to Virtual Local Area Networks (VLANs), configure VLANs and routing between VLANs.

Assessment 1

Assessment Tool: CISCO Academy-provided concepts and skills exams

Assessment Date: Winter 2018

Assessment Cycle: Every Three Years

Course section(s)/other population: Random sample of a minimum of three sections over the three-year period

Number students to be assessed: All students

How the assessment will be scored: The concepts exam is scored by CISCO. The skills exam is scored by WCC faculty, in accordance with CISCO guidelines.

Standard of success to be used for this assessment: At least 70% of students must score 70% or higher on the outcome related questions.

Who will score and analyze the data: Department Faculty and external sources (if available)

4. Configure and troubleshoot routing between networks, using Routing Information Protocol (RIP).

Assessment 1

Assessment Tool: CISCO-provided concepts and skills exams

Assessment Date: Winter 2018

Assessment Cycle: Every Three Years

Course section(s)/other population: Random sample of a minimum of three sections over the three-year period

Number students to be assessed: All students

How the assessment will be scored: Both exams are prepared by CISCO. The concepts exam will be scored by CISCO. The skills exam will be scored by WCC faculty, in accordance with CISCO guidelines.

Standard of success to be used for this assessment: At least 70% of the students will score 70% or higher on outcome related questions.

Who will score and analyze the data: Department Faculty and external sources (if available)

5. Identify correct statements pertaining to, and configure Dynamic Host Configuration Protocol (DHCP)

Assessment 1

Assessment Tool: CISCO-provided concepts and skills exams

Assessment Date: Winter 2018

Assessment Cycle: Every Three Years

Course section(s)/other population: Random sample of a minimum of three sections over the three-year period

Number students to be assessed: All students

How the assessment will be scored: The concepts exam will be scored by CISCO systems. The skills exam will be scored by WCC faculty, in accordance with CISCO guidelines.

Standard of success to be used for this assessment: At least 70% of the students will score 70% or higher on outcome related questions.

Who will score and analyze the data: Department Faculty and external sources (if available)

6. Identify correct statements pertaining to, and configure Access Control Lists (ACLs).

Assessment 1

Assessment Tool: CISCO-provided concepts and skills exams

Assessment Date: Winter 2018

Assessment Cycle: Every Three Years

Course section(s)/other population: Random sample of a minimum of three sections over the three-year period

Number students to be assessed: All students

How the assessment will be scored: The concepts exam will be scored by CISCO systems. The skills exam will be scored by WCC faculty using the CISCO-provided rubric.

Standard of success to be used for this assessment: At least 70% of the students will score 70% or higher on outcome related questions.

Who will score and analyze the data: Department Faculty and external sources (if available)

7. Identify correct statements pertaining to, and configure Network Address Translation (NAT).

Assessment 1

Assessment Tool: CISCO-provided concepts and skills exams

Assessment Date: Winter 2018

Assessment Cycle: Every Three Years

Course section(s)/other population: Random sample of a minimum of three sections over the three-year period

Number students to be assessed: All students

How the assessment will be scored: The concepts exam will be scored by CISCO systems. The skills exam will be scored by WCC faculty, using the CISCO-provided rubric.

Standard of success to be used for this assessment: At least 70% of the students will score 70% or higher on outcome related questions.

Who will score and analyze the data: Department Faculty and external sources (if available)

8. Identify correct statements pertaining to, and use Cisco IOS commands to discover, manage, and maintain Cisco networking devices.

Assessment 1

Assessment Tool: CISCO-provided concepts and skills exams

Assessment Date: Winter 2018

Assessment Cycle: Every Three Years

Course section(s)/other population: Random sample of a minimum of three sections over the three-year period

Number students to be assessed: All students

How the assessment will be scored: The concepts exam will be scored by CISCO systems. The skills exam will be scored by WCC faculty, using the CISCO-provided rubric.

Standard of success to be used for this assessment: At least 70% of the students will score 70% or higher on the outcome related questions.

Who will score and analyze the data: Department Faculty and external sources (if available)

Course Objectives

1. Configure a router to route between multiple directly connected networks.
2. Configure and troubleshoot static routes.
3. Implement RIPv2.
4. Determine the route source, administrative distance, and metric for a given route.
5. Configure basic switch settings to meet network requirements.
6. Configure a switch using security best practices in a small to medium-sized business network.
7. Implement VLANs to segment a small to medium sized business network.
8. Configure routing between VLANs in a small to medium-sized business network.
9. Configure standard IPv4 ACLs to filter traffic in a small to medium-sized business network.
10. Troubleshoot IPv4 ACL issues.
11. Implement DHCPv4 to operate across multiple LANs in a small to medium-sized business network.
12. Implement DHCPv6 to operate across multiple LANs in a small to medium-sized business network.
13. Configure NAT services on the edge router to provide IPv4 address scalability in a small to medium-sized business network.
14. Troubleshoot NAT issues in a small to medium-sized business network.
15. Use discovery protocols to map a network topology.
16. Configure NTP and Syslog in a small to medium-sized business network
17. Maintain router and switch configuration and IOS files.

New Resources for Course

Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

Level III classroom
Other: Internetworking/Security Lab

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>John Trame</i>	<i>Faculty Preparer</i>	<i>Oct 27, 2017</i>
Department Chair/Area Director: <i>Philip Geyer</i>	<i>Recommend Approval</i>	<i>Oct 30, 2017</i>
Dean: <i>Eva Samulski</i>	<i>Recommend Approval</i>	<i>Oct 31, 2017</i>
Curriculum Committee Chair: <i>David Wooten</i>	<i>Recommend Approval</i>	<i>Feb 26, 2018</i>
Assessment Committee Chair: <i>Michelle Garey</i>	<i>Recommend Approval</i>	<i>Feb 27, 2018</i>
Vice President for Instruction: <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Feb 28, 2018</i>