

Course Assessment Report  
Washtenaw Community College

Discipline	Course Number	Title
Computer Networking Technology	216	CNT 216 06/12/2023-Switching, Routing and Wireless Essentials
College	Division	Department
Business and Computer Technologies	Business and Computer Technologies	Computer Science & Information Technology
Faculty Preparer		John Trame
Date of Last Filed Assessment Report		08/30/2019

**I. Review previous assessment reports submitted for this course and provide the following information.**

1. Was this course previously assessed and if so, when?

Yes  Winter 2019
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2. Briefly describe the results of previous assessment report(s).

One section of this class was distance learning, and the other was mixed mode. Many students did not take advantage of the live instructor help in the lab time. The online experience does not currently provide adequate interaction student-to-instructor, or student-to-student. We need to find methods to make this course more interactive. I also believe that students need a lot more time to absorb material and practice designing and configuring networks.
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3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

I planned to develop more information sheet hand outs, and recorded demonstrations. We also needed to find a way to make the distance learning more interactive.  This semester I created several more information sheets and recorded several more demonstrations. I also spent more time in the F2F class demonstrating the skills needed to successfully meet the desired outcomes of this course.
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This semester I was not able to get the DL section more interactive with each other. However, it appears that the additional materials helped. Also students were more interactive with me.

## II. Assessment Results per Student Learning Outcome

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

- Assessment Plan
  - Assessment Tool: Outcome-related questions on the Cisco final exam
  - Assessment Date: Winter 2021
  - 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)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2023	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	28

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

This assessment includes both sections. One F2F and one DL.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

This tool is the Cisco Networking Academy final exam. It includes multiple-choice, matching questions, and simulations.

The test is graded by Cisco.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

10% (6) of the 60 questions pertain to this outcome.

The F2F section: 76.6% of these students met the standard of success for this outcome.

The DL section: 91.1% of these students met the standard of success for this outcome.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

100 % of the students met the standard of success for this outcome.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Since the students met the standard of success for this outcome, I see no need to plan for continuous improvement for this outcome.

There is a wide discrepancy between DL and F2F scores, likely due to lack of proctoring for DL students. This will hopefully be resolved as we move forward with HonorLock/other proctoring solutions.

The skills exams are not an efficient method of assessment, nor are they as accurate in assessing learning as the Cisco exams. The extra tool will be removed for future assessments.

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

- Assessment Plan

- Assessment Tool: Outcome-related questions on the Cisco final exam
- Assessment Date: Winter 2021
- 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)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2023	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	28

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Both the F2F and DL sections were included in this assessment.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

This tool is the Cisco Networking Academy final exam. It includes multiple-choice, matching questions, and simulations.

The test is graded by Cisco.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

6.7% (4) of the 60 questions pertain to the outcome.

F2F section: 78.9% of these students met the standard of success for this outcome.

DL section: 90.6% of these students met the standard of success for this outcome.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students are able to answer questions appropriately regarding VLANs and routing between VLANs.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students strength is in creating VLANs. The area that needs improvement is configuring the trunks and routing between the VLANs.

There is a wide discrepancy between DL and F2F scores, likely due to lack of proctoring for DL students. This will hopefully be resolved as we move forward with HonorLock/other proctoring solutions.

The skills exams are not an efficient method of assessment, nor are they as accurate in assessing learning as the Cisco exams. The extra tool will be removed for future assessments.

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

- Assessment Plan
  - Assessment Tool: Outcome-related questions on the Cisco final exam
  - Assessment Date: Winter 2021
  - 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)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2023	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	28

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

This assessment includes both the F2F and the DL sections.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

This tool is the Cisco Networking Academy final exam. It includes multiple-choice, matching questions, and simulations.  
The test is graded by Cisco.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes  
(4) 6.7% of the 60 questions pertain to this outcome.

F2F section: 75.3% of the students met the standard of success for this outcome.

DL section: 94.2 % of the students met the standard of success for this outcome.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students are good at answering questions pertaining to DHCP.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students need to improve their ability to configure IPv4 DHCP pools and IPv6 stateless and stateful distribution of addresses.

There is a wide discrepancy between DL and F2F scores, likely due to lack of proctoring for DL students. This will hopefully be resolved as we move forward with HonorLock/other proctoring solutions.

The skills exams are not an efficient method of assessment, nor are they as accurate in assessing learning as the Cisco exams. The extra tool will be removed for future assessments.

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

- Assessment Plan
  - Assessment Tool: Outcome-related questions on the Cisco final exam
  - Assessment Date: Winter 2021
  - 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)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2023	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	28

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

This assessment includes both the F2F and the DL sections.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

This tool is the Cisco Networking Academy final exam. It includes multiple-choice, matching questions, and simulations.  
The test is graded by Cisco.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes  
6.0% of the 60 questions pertain to this outcome.  
F2F section: 85.7% of these students met the standard of success for this outcome.  
DL section: 90.9% of these students met the standard of success for this outcome.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students are good at answering questions pertaining to wireless networking.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The skills exam was so full of other configuration tasks. If wireless networking was also included, the students would not be able to finish the exam. This is one of many examples leading me to believe these skills outcomes may need to be eliminated.

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

- Assessment Plan
  - Assessment Tool: Outcome-related questions/tasks on the Cisco skills-based final exam
  - Assessment Date: Winter 2021
  - 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

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2023	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	28

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

This assessment includes both the F2F and the DL sections.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Only overall data was collected for the skills exam. The skills exam will be removed from future assessments.

The students were given a Packet Tracer (simulator) file with an internetwork of routers and switches already connected. The students are required to configure the following:

Basic setting: device name, passwords, basic security settings

One router is configured as the IPv4 DHCP server.

One router is configured as the IPv4 DHCP relay agent.

All computers must obtain IP addresses automatically from the DHCP server.

All main office client computers must obtain IPv6 addresses automatically via stateless IPv6. Addresses must match the appropriate VLAN.

They must configure three VLANs, and an EtherChannel connection between two switches.

They must configure advanced switch security to shut down interfaces when violations are detected.

They must configure static routes to route traffic between the remote branch office and the main office.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

100% of the students configured the basic route and switch settings correctly.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

100 % of the students met the standard of success for this outcome.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Since the students met the standard of success for this outcome, I see no need to plan for continuous improvement for this outcome.

There is a wide discrepancy between DL and F2F scores, likely due to lack of proctoring for DL students. This will hopefully be resolved as we move forward with HonorLock/other proctoring solutions.

The skills exams are not an efficient method of assessment, nor are they as accurate in assessing learning as the Cisco exams. The extra tool will be removed for future assessments.

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

- Assessment Plan
  - Assessment Tool: Outcome-related questions/tasks on the Cisco skills-based final exam
  - Assessment Date: Winter 2021
  - 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

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2023	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	28

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students are included in this assessment.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

This assessment includes both the F2F and the DL sections.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Only overall data was collected for the skills exam. The skills exam will be removed from future assessments.

The students were given a Packet Tracer (simulator) file with an internetwork of routers and switches already connected. The students are required to configure the following:

Basic setting: device name, passwords, basic security settings

One router is configured as the IPv4 DHCP server.

One router is configured as the IPv4 DHCP relay agent.

All computers must obtain IP addresses automatically from the DHCP server.

All main office client computers must obtain IPv6 addresses automatically via stateless IPv6. Addresses must match the appropriate VLAN.

They must configure three VLANs, and an EtherChannel connection between two switches.

They must configure advanced switch security to shut down interfaces when violations are detected.

They must configure static routes to route traffic between the remote branch office and the main office.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

F2F section: (11/16) 68.75% of these students met the standard of success for this outcome.

DL section: (10/12) 84.6% of these students met the standard of success for this outcome.

Total: (21/28) 75% of the students met the standard of success for this outcome.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students are able to answer questions appropriately regarding VLANs and routing between VLANs.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students strength is in creating VLANs. The area that needs improvement is configuring the trunks and routing between the VLANs.

There is a wide discrepancy between DL and F2F scores, likely due to lack of proctoring for DL students. This will hopefully be resolved as we move forward with HonorLock/other proctoring solutions.

The skills exams are not an efficient method of assessment, nor are they as accurate in assessing learning as the Cisco exams. The extra tool will be removed for future assessments.

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

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

- Assessment Date: Winter 2021
- 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

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2023	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	28

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

This assessment includes both the F2F and the DL sections.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Only overall data was collected for the skills exam. The skills exam will be removed from future assessments.

The students were given a Packet Tracer (simulator) file with an internetwork of routers and switches already connected. The students are required to configure the following:

Basic setting: device name, passwords, basic security settings

One router is configured as the IPv4 DHCP server.

One router is configured as the IPv4 DHCP relay agent.

All computers must obtain IP addresses automatically from the DHCP server.

All main office client computers must obtain IPv6 addresses automatically via stateless IPv6. Addresses must match the appropriate VLAN.

They must configure three VLANs, and an EtherChannel connection between two switches.

They must configure advanced switch security to shut down interfaces when violations are detected.

They must configure static routes to route traffic between the remote branch office and the main office.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

21 of the 28 students (75%) of the students met the standard of success for this outcome.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students are good at answering questions pertaining to DHCP.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students need to improve their ability to configure IPv4 DHCP pools and IPv6 stateless and stateful distribution of addresses.

There is a wide discrepancy between DL and F2F scores, likely due to lack of proctoring for DL students. This will hopefully be resolved as we move forward with HonorLock/other proctoring solutions.

The skills exams are not an efficient method of assessment, nor are they as accurate in assessing learning as the Cisco exams. The extra tool will be removed for future assessments.

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

- Assessment Plan
  - Assessment Tool: Outcome-related questions/tasks on the Cisco skills-based final exam
  - Assessment Date: Winter 2021
  - 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

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2023	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	28

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

This assessment includes both the F2F and the DL sections.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The skills exam did not include a wireless portion.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No

We did not include a wireless portion in this skills exam. Therefore no students could be evaluated for success of this skills outcome.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students are good at answering questions pertaining to wireless networking.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The skills exam was so full of other configuration tasks. If wireless networking was also included, the students would not be able to finish the exam. This is one of many examples leading me to believe these skills outcomes may need to be eliminated.

### III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

The addition of more information sheets and demonstrations was somewhat helpful.

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

The students seem to be learning the concepts fairly well. However, the students have difficulty configuring the devices properly.

Students seem to do well on the labs which are written with step by step instructions. However, when they are confronted with the more real-world design which requires them to analyze a situation and develop their own solution, they fail to perform up to standards.

We need more time dedicated to developing the critical thinking skills.

3. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

This will be shared in a department meeting.
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- 4.

Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Assessment Tool	Remove skills assessment, assess the course with the written Cisco exam only.	As explained in the assessment report for CNT 206, it is my opinion as a subject matter expert that the Cisco exam is a much stronger measurement of student learning.	2023
Course Assignments	I plan to create more critical thinking style assignments. These assignments will not be step by step guides.	These assignments will give the students more practice analyzing a business situation/problem and developing their own solutions for the problems, then implement their plans and test their configurations.	2023
Other: Data collection process	To ensure that I have access to the assessment data housed at the Cisco Networking Academy site I will create all the classes at that site in future semesters, add myself as an instructor in each class along with the instructor who is	This year, Cisco changed their policy. They no longer permit any instructor, or the main contact for a given academy, such as WCC to access a class that they are not teaching. Therefore, I must be listed as an instructor on	2023

	actually teaching the class.	<p>every section of every class at the Cisco Networking Academy site, to have access to the assessment data.</p> <p>Cisco also changed their policy regarding access to previous semester classes. Previously, we had access to three years' worth of classes prior to archival. Now they are archiving classes within six months of the start date of a given class. For example, all fall 2022 and earlier classes are already archived. We have no access to archived classes. Therefore, I cannot retrieve data from any classes prior to the Winter 2023 semester.</p>	
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5. Is there anything that you would like to mention that was not already captured?

6.
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### III. Attached Files

[CNT216-W2023 Final Exam Summary](#)

**Faculty/Preparer:** John Trame **Date:** 06/28/2023

**Department Chair:** Scott Shaper **Date:** 06/30/2023

**Dean:** Eva Samulski **Date:** 07/06/2023

**Assessment Committee Chair:** Jessica Hale **Date:** 01/04/2024

**Course Assessment Report  
Washtenaw Community College**

Discipline	Course Number	Title
Computer Networking Technology	216	CNT 216 05/21/2019- Routing and Switching Essentials
Division	Department	Faculty Preparer
Business and Computer Technologies	Computer Science & Information Technology	John Trame
Date of Last Filed Assessment Report		11/01/2017

**I. Review previous assessment reports submitted for this course and provide the following information.**

1. Was this course previously assessed and if so, when?

No

2. Briefly describe the results of previous assessment report(s).

3.

4. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

5.

**II. Assessment Results per Student Learning Outcome**

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

- Assessment Plan
  - Assessment Tool: CISCO Academy-provided concepts and skills exams
  - Assessment Date: Winter 2018
  - 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)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
29	25

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Withdrawal from the course.  
Only 25 students completed the final exam.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

We had one live session, one mixed mode section, and one distance learning section.  
All three sections were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

This outcome consisted of eleven questions on the online final exam, which was written and graded by Cisco Systems.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: <u>Yes</u>
19 of 25 students scored 70% or better for this set of questions.
This is a success rate of 76.00%.
This meets the success criteria.
This is shown on the "Switching Fundamentals" sheet of the Excel Spreadsheet.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students showed strength in using commands to configure switches.
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8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

If we had more time in this course, we could spend more time evaluating student conceptual understanding to clarify areas of concern.
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Outcome 2: Identify correct statements pertaining to the basic function of routers, and perform basic router configuration.

- Assessment Plan
    - Assessment Tool: CISCO Academy-provided concepts and skills exams
    - Assessment Date: Winter 2018
    - 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)
1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
29	25

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Withdrawal from the course.  
Only 25 students completed the final exam.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

We had one live session, one mixed mode section, and one distance learning section.  
All three sections were assessed using the Cisco Final Concepts exam.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

This outcome was measured using 12 or 13 questions from the final exam. The final exam was written and graded by Cisco Systems. This final exam had three randomly generated forms, to help prevent cheating. As a result some students received 12 questions, while others received 13 questions for this outcome.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes  
21 of the 25 students scored 70% or better on this set of questions.  
This is a success rate of 84.0%.  
This meets the standard of success.

These results are shown on the "Routing Fundamentals" sheet of the Excel spreadsheet.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students understood the basic router functions and operations as well as the use of basic commands.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

More hands-on practice is always beneficial. However, this course is already overloaded with too much material in too little time.

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

- Assessment Plan
  - Assessment Tool: CISCO Academy-provided concepts and skills exams
  - Assessment Date: Winter 2018
  - 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)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
29	25

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Withdrawal from the course.  
Only 25 students completed the final exam.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

We had one live session, one mixed mode section, and one distance learning section.  
All three sections were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam written and graded by Cisco Systems contained three questions pertaining to this outcome.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No  
13 of 25 students scored 70% or above for this set of questions.  
The success rate was 52.0%%.  
This does not meet the standard of success.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students seemed to understand the basic concept and use of Virtual Local Area Networks.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

If we had more time in this course, we could spend more time evaluating student conceptual understanding to clarify areas of concern.

Students need more hands-on practice configuring VLANs, and routing between VLANs.

More hands-on practice is always beneficial. However, this course is already overloaded with too much material in too little time.

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

- Assessment Plan
  - Assessment Tool: CISCO-provided concepts and skills exams
  - Assessment Date: Winter 2018
  - 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)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
29	25

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Withdrawal from the course.

Only 25 students completed the final exam.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

We had one live session, one mixed mode section, and one distance learning section.

All three sections were assessed using the Cisco written final concepts exam.

Unfortunately, I only had access to my own section of the skills final exam.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The online Cisco concepts final exam had only two questions pertaining to this outcome.

I also used a hands-on skills exam to assess this outcome.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No

16 of 25 students scored 70% or better on these two questions.

This is a success rate of 64.0%. This does not meet the success standard outlined for this outcome.

I had eight students complete the skills final exam. All eight successfully configured the RIP routing protocol.

My students demonstrated the ability to configure the RIP routing protocol in a practical hands-on skills environment.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students understood the basic concepts of automatic routing via the RIP routing protocol.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students lacked troubleshooting skills. They need more hands-on practical skills time, in which they can practice troubleshooting networks that are incorrectly configured.

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

- **Assessment Plan**
  - Assessment Tool: CISCO-provided concepts and skills exams
  - Assessment Date: Winter 2018
  - 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)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
29	25

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Withdrawal from the course.

Only 25 students completed the final exam.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

We had one live session, one mixed mode section, and one distance learning section.

All three sections were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The Cisco online Final Concepts Exam contained five questions pertaining to this outcome.

I also used a hands-on skills exam to assess this outcome. Unfortunately, I did not have access to the skills exam used for the other two sections of this class.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No

13 of 25 students scored 70% or better on this set of questions.

This is a success rate of 67.91%. This does not meet the success rate requirement for this outcome.

My eight students did manage to configure the DHCP server and the DHCP relay agent (some needed help).

Overall, I would say this is a close call.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students understood the basic concepts of DHCP.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students lacked the skills to correctly configure DHCP server and relay agents.

If we had more time in this course, we could spend more time evaluating student conceptual understanding to clarify areas of concern.

More hands-on practice is always beneficial. However, this course is already overloaded with too much material in too little time.

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

- Assessment Plan
  - Assessment Tool: CISCO-provided concepts and skills exams
  - Assessment Date: Winter 2018
  - 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)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
29	25

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Withdrawal from the course.  
Only 25 students completed the final exam.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

We had one live session, one mixed mode section, and one distance learning section.  
All three sections were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The Cisco online Final Concepts Exam contained two questions pertaining to this outcome.  
I also used a hands-on skills exam to assess this outcome.  
I did not have access to the other skills exams in the classes that I did not teach.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No  
11 of 25 students scored 70% or better on these two questions.  
This is a success rate of 44%.  
This does not meet the success standard of 70% of the students scoring 70% or better on the questions for this outcome.

My eight students completed this task on the Hands-onSkills Based Exam (some required help). Unfortunately, I did not have access to the other skills exams in the classes that I did not teach. Therefore, I cannot analyse those results.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students understood the purpose and use of Access Control Lists.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students need more hands-on skills time to practice proper configuration and placement of ACLs.

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

- Assessment Plan
  - Assessment Tool: CISCO-provided concepts and skills exams
  - Assessment Date: Winter 2018
  - 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)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
29	25

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Withdrawal from the course.  
Only 25 students completed the final exam.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

We had one live session, one mixed mode section, and one distance learning section.  
All three sections were assessed using the Cisco Final Concepts Exam.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The Cisco Final Concepts Exam contained six questions pertaining to this outcome.  
I also provided a hands-on skills exam to assess this outcome.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No  
17 of 25 students scored 70% or better on this set of questions.  
This is a success rate of 68%. This does not meet the required success parameter for this outcome.  
Six of my eight students successfully configured Port Address Translation on the skills exam.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students understood the basic concepts of Network Address Translation (NAT) and Port Address Translation (PAT).

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students could benefit from more hands-on skills time to reinforce the proper configuration and placement of NAT/PAT commands.

The skills final exam revealed that some students needed a deeper understanding of NAT pool creation and proper placement of commands, to enable the correct router to translate the appropriate private addresses into public addresses.

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

- Assessment Plan
  - Assessment Tool: CISCO-provided concepts and skills exams
  - Assessment Date: Winter 2018
  - 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)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
29	25

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Withdrawal from the course.

Only 25 students completed the final exam.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

We had one live session, one mixed mode section, and one distance learning section.

All three sections were assessed using the Cisco Final Concepts Exam.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The Cisco Final Concepts Exam contained 11 questions pertaining to this outcome.

I also used a skills exam to assess this outcome.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

18 of 25 students scored 70% or better on this set of questions

This is a success rate of 72%. This meets the success parameter for this outcome.

My eight students successfully configured the appropriate commands to meet this outcome.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students understood the concepts and commands used to accomplish this outcome.

- Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The students were quite successful with this outcome. Perhaps a little more hands-on skills practice will get future students closer to a 100% success rate.

### III. Course Summary and Intended Changes Based on Assessment Results

- Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

N/A

- Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

This course is partially meeting the student needs.

Areas of concern are:

Virtual Local Area Networks (VLANs), including routing between VLANs.

Configuration of the RIP routing protocol.

DHCP server and relay agent configuration.

Network Address Translation and Port Address Translation configuration.

- Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

This information needs to be shared at department meetings. Perhaps a subgroup of networking instructors can discuss changes.

- Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Other: Increase student contact time	I believe we need to make this course a 15 week course.	If we had more time in this course, we could spend more time questioning	2020

		<p>student conceptual understanding, and then clarifying areas of concern.</p> <p>More hands-on practice is always beneficial.</p> <p>However, this course is already overloaded with too much material in too little time.</p>	
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5. Is there anything that you would like to mention that was not already captured?

6.
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### III. Attached Files

[CNT216 Assessment-W2019-ver2](#)

**Faculty/Preparer:** John Trame **Date:** 05/23/2019

**Department Chair:** Philip Geyer **Date:** 05/23/2019

**Dean:** Eva Samulski **Date:** 06/05/2019

**Assessment Committee Chair:** Shawn Deron **Date:** 08/29/2019

**Course Assessment Report**  
**Washtenaw Community College**

Discipline	Course Number	Title
Computer Networking Technology	216	CNT 216 06/28/2017- Routing and Switching Essentials
Division	Department	Faculty Preparer
Business and Computer Technologies	Computer Instruction	John Trame
Date of Last Filed Assessment Report		

**I. Assessment Results per Student Learning Outcome**

Outcome 1: Describe basic switching concepts, and perform basic switch configuration.

- Assessment Plan
  - Assessment Tool: CISCO Academy-provided concepts and skills exams
  - Assessment Date: Fall 2016
  - Course section(s)/other population: 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 better.
  - Who will score and analyze the data: Department Faculty and external sources (if available)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2017	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	26

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Two students did not take the final exams.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students who completed the Cisco Networking Academy Concepts Final Exam were included in the assessment. 26 of the 28 students accessed and completed the exam.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The tool used was the Cisco Networking Academy Concepts Final Exam, which is an online exam that includes multiple choice and matching questions.

The Cisco Networking Academy Concepts Final Exam was randomized in three versions (Test 1A, 2A and 3A) for section DH1 and section MH1. Each exam had 50 questions. I selected every question on each of the three exams to identify all questions pertaining to this outcome.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

Analysis of the 3 exams per section, for both sections students accumulated 218 points of 298 total possible points. This represents a 73.15% success rate according to our standards set for this course.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students understand the most basic switching concepts.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students need to improve understanding of more advanced switching concepts.

Outcome 2: Describe the basic function of routers, and perform basic router configuration.

- Assessment Plan
  - Assessment Tool: CISCO Academy-provided concepts and skills exams
  - Assessment Date: Fall 2016
  - Course section(s)/other population: 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 better.
  - Who will score and analyze the data: Department Faculty and external sources (if available)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2017	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	26

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Two students did not take the final exams.
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4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students who completed the Cisco Networking Academy Concepts Final Exam were included in the assessment. 26 of the 28 students accessed and completed the exam.
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5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The tool used was the Cisco Networking Academy Concepts Final Exam, which is an online exam that includes multiple choice and matching questions.

The Cisco Networking Academy Concepts Final Exam was randomized in three versions (Test 1A, 2A and 3A) for section DH1 and section MH1. Each exam had 50 questions. I selected every question on each of the three exams to identify all questions pertaining to this outcome.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

Analysis of the 3 exams per section, for both sections students accumulated 178 points of 228 total possible points. This represents a 78.07% success rate according to our standards set for this course.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students understand the basic routing functions, including configuration commands.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students need to improve their understanding of IP addressing, especially subnetting. More practice problems may help.

Outcome 3: Describe Virtual Local Area Networks (VLANs), configure VLANs and routing between VLANs.

- Assessment Plan
  - Assessment Tool: CISCO Academy-provided concepts and skills exams
  - Assessment Date: Fall 2016
  - Course section(s)/other population: 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 better.
- Who will score and analyze the data: Department Faculty and external sources (if available)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2017	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	26

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Two students did not take the final exams.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students who completed the Cisco Networking Academy Concepts Final Exam were included in the assessment. 26 of the 28 students accessed and completed the exam.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The tool used was the Cisco Networking Academy Concepts Final Exam, which is an online exam that includes multiple choice and matching questions.

The Cisco Networking Academy Concepts Final Exam was randomized in three versions (Test 1A, 2A and 3A) for section DH1 and section MH1. Each exam had 50 questions. I selected every question on each of the three exams to identify all questions pertaining to this outcome.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No

Analysis of the 3 exams per section, for both sections students accumulated 89 points of 130 total possible points. This represents a 68.46% success rate according to our standards set for this course.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students seem to understand the commands required to create VLANs, and assign interfaces to VLANs.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Routing between VLANs appears to be an area of confusion for students. Students may need more hands-on practice configuring routing between VLANs.

#### Outcome 4: Configure and troubleshoot routing protocols(RIP and OSPF).

- Assessment Plan
  - Assessment Tool: CISCO-provided concepts and skills exams
  - Assessment Date: Fall 2016
  - Course section(s)/other population: At least 3 sections during the three-year cycle.
  - 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 better.
  - Who will score and analyze the data: Department Faculty and external sources (if available)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2017	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	26

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Two students did not take the final exams.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students who completed the Cisco Networking Academy Concepts Final Exam were included in the assessment. 26 of the 28 students accessed and completed the exam.

\*Cisco changed the curriculum in January 2017. This outcome has been replaced by Network Services. We need to submit a new syllabus to include this new outcome.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The tool used was the Cisco Networking Academy Concepts Final Exam, which is an online exam that includes multiple choice and matching questions.

The Cisco Networking Academy Concepts Final Exam was randomized in three versions (Test 1A, 2A and 3A) for section DH1 and section MH1. Each exam had 50 questions. I selected every question on each of the three exams to identify all questions pertaining to this outcome.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

Analysis of the 3 exams per section, for both sections students accumulated 74 points of 98 total possible points. This represents a 75.51% success rate according to our standards set for this course.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The majority of students understand RIP configuration and implementation. OSPF is no longer in this semester, it has been moved to semester three.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Redistribution of static routes into the RIP routing protocol is an area that needs improvement.

Outcome 5: Describe and configure Dynamic Host Configuration Protocol.

- Assessment Plan
  - Assessment Tool: CISCO-provided concepts and skills exams
  - Assessment Date: Fall 2016
  - Course section(s)/other population: At least 3 sections during the three-year cycle.
  - 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 better.
  - Who will score and analyze the data: Department Faculty and external sources (if available)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2017	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	26

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Two students did not take the final exams.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students who completed the Cisco Networking Academy Concepts Final Exam were included in the assessment. 26 of the 28 students accessed and completed the exam.

\*Cisco changed the curriculum in January 2017. This outcome has been replaced by Basic Device Management. We need to submit a new syllabus to include this new outcome.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The tool used was the Cisco Networking Academy Concepts Final Exam, which is an online exam that includes multiple choice and matching questions.

The Cisco Networking Academy Concepts Final Exam was randomized in three versions (Test 1A, 2A and 3A) for section DH1 and section MH1. Each exam had 50 questions. I selected every question on each of the three exams to identify all questions pertaining to this outcome.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No

Analysis of the 3 exams per section, for both sections students accumulated 87 points of 130 total possible points. This represents a 66.92% success rate according to our standards set for this course.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students seem to understand the theory of DHCP operation.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Areas that need improvement include configuration of DHCP pools, and proper placement of DHCP Helper configuration, to provide remote client access to the DHCP server.

Outcome 6: Describe and configure Access Control Lists.

- Assessment Plan
  - Assessment Tool: CISCO-provided concepts and skills exams
  - Assessment Date: Fall 2016
  - Course section(s)/other population: At least 3 sections during the three-year cycle
  - 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 better.
  - Who will score and analyze the data: Department Faculty and external sources (if available)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2017	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	26

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Two students did not take the final exams.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students who completed the Cisco Networking Academy Concepts Final Exam were included in the assessment. 26 of the 28 students accessed and completed the exam.

\*Cisco changed the curriculum in January 2017. This outcome has been replaced by Software. We need to submit a new syllabus to include this new outcome.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The tool used was the Cisco Networking Academy Concepts Final Exam, which is an online exam that includes multiple choice and matching questions.

The Cisco Networking Academy Concepts Final Exam was randomized in three versions (Test 1A, 2A and 3A) for section DH1 and section MH1. Each exam had 50 questions. I selected every question on each of the three exams to identify all questions pertaining to this outcome.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

Analysis of the 3 exams per section, for both sections students accumulated 57 points of 80 total possible points. This represents a 71.25% success rate according to our standards set for this course.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students seem to understand the purpose and configuration of Access Control Lists.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Areas that need improvement are placement and direction of Access Control Lists, and proper calculation of wild card masks to apply ACLs to subnetworks.
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Outcome 7: Describe and configure Network Address Translation.

- Assessment Plan
  - Assessment Tool: CISCO-provided concepts and skills exams
  - Assessment Date: Fall 2016
  - Course section(s)/other population: At least 3 sections during the three-year cycle
  - 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 better.
  - Who will score and analyze the data: Department Faculty and external sources (if available)

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2017	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
28	26

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Two of the students did not take the final exams.
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4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students who completed the Cisco Networking Academy Concepts Final Exam were included in the assessment. 26 of the 28 students accessed and completed the exam.

\*Cisco changed the curriculum in January 2017. This outcome has been replaced by Security. We need to submit a new syllabus to include this new outcome.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The tool used was the Cisco Networking Academy Concepts Final Exam, which is an online exam that includes multiple choice and matching questions.

The Cisco Networking Academy Concepts Final Exam was randomized in three versions (Test 1A, 2A and 3A) for section DH1 and section MH1. Each exam had 50 questions. I selected every question on each of the three exams to identify all questions pertaining to this outcome.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No

Analysis of the 3 exams per section, for both sections students accumulated 99 points of 154 total possible points. This represents a 64.29% success rate according to our standards set for this course.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students seem to understand the purpose, and basic operation of Network Address Translation.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Configuration is the major problem. Students need more hands-on skill practice with configuration, including the placement of inside and outside interfaces.

## II. Course Summary and Action Plans Based on Assessment Results

1. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

One section of this class was distance learning, and the other was mixed mode. Many students did not take advantage of the live in the lab time. The online experience does not currently provide adequate interaction student-to-instructor, or student-to-student. We need to find methods to make this course more interactive. I also believe that students need a lot more time to absorb material and practice designing and configuring networks.

2. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

This will be shared in a department meeting.

3. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	I plan to develop more information sheet hand outs, and recorded demonstrations.  We also need to find a way to make the distance learning more interactive.	Students need to better understand network design and configuration.	2018

4. Is there anything that you would like to mention that was not already captured?

5.

### III. Attached Files

[Final Exam Assessment](#)  
[CNT 216 description of process](#)

**Faculty/Preparer:** John Trame **Date:** 07/21/2017

**Department Chair:** Philip Geyer **Date:** 08/09/2017

**Dean:** Eva Samulski **Date:** 08/10/2017

**Assessment Committee Chair:** Michelle Garey **Date:** 10/30/2017

