Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Computer Networking Technology	206	CNT 206 04/27/2023- Introduction to Networks
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		03/27/2017

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

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

Yes Winter 2019

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

Students with the prerequisite skills performed as expected in this course. Students without prerequisite skills did not.

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

Previous Action Plan: More questions pertaining to the identified outcomes would improve the quantity of data collected, which could provide more significant analysis of student performance. Add more practice/assignments related to all outcomes, and especially related to number systems, IP Addressing and cabling (which seem to need the most improvement). Additional practice with these concepts will improve student performance. Changes Implemented: Unfortunately, we have no control over the final exam written by the Cisco Networking Academy. Therefore, we cannot add outcome specific questions to the

final exam. We can however, better align our outcomes with the Cisco requirements. I did add several more demonstrations and practice problems this semester.

II. Assessment Results per Student Learning Outcome

Outcome 1: Identify the devices and services used to support communications in data networks and the Internet.

- Assessment Plan
    - Assessment Tool: Outcome-related questions on the Cisco final exam
    - Assessment Date: Fall 2020
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: External evaluation
    - Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the outcome-related questions.
    - Who will score and analyze the data: The exam will be automatically graded by the Cisco Networking Academy server. The results will be analyzed by our full-time 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
52	29

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.

This is only my face-to-face and my DL section. I did not have access to the data for the sections that I did not teach. However, there is a plan in place to ensure I have this access for future assessment reports.

The information is housed at the Cisco Networking Academy site. Classes from previous semesters have already been archived. I do not have access to archived classes.

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 is only my face-to-face and my DL section.

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

This was the Cisco Networking Academy final exam. It is written and graded by the Cisco Networking Academy.

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

The F2F section: 88.1% of the students met the standard of success for this outcome.

The DL section: 96.9% of the students met the standard of success for this outcome.

These results are based on questions pertaining to this outcome on the final exam. I did not record student-by-student data and when I went back to check again, the exam had been archived. I will assess all sections and provide student-by-student data for future assessments.

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

Students performed well when identifying devices.

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.

Identifying services could use some improvement.

Outcome 2: Design, calculate, and apply subnet masks and addresses to fulfill given requirements in internet protocol version 4 (IPv4) and IPv6 networks.

- Assessment Plan
    - Assessment Tool: Outcome-related questions/tasks on the Cisco skills-based final exam
    - Assessment Date: Fall 2020
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or higher
    - 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
52	29

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.

This is only my face-to-face and my DL section. I did not have access to the data for the sections that I did not teach. However, there is a plan in place to ensure I have this access for future assessment reports. The information is housed at the Cisco Networking Academy site. Classes from previous semesters have already been archived. I do not have access to archived classes.

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 includes my day face-to-face section and my DL section.

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

This was the Cisco Networking Academy final exam. It is written and graded by the Cisco Networking Academy.

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
There are two addressing schemes that students must master IPv4 and IPv6. The following results break down the student success for each of these addressing schemes. The F2F section: 64.4% met the IPv6 outcome 59.8% met the IPv4 outcome These students did not meet the standard of success for this outcome. The DL section: 90.5% met the IPv6 outcome 92.3% met the IPv4 outcome These students did meet the standard of success for this outcome. I did not retain the individual student data after calculating the scores for this assessment. In future assessments I will assess using only the Cisco written exam (not the skills-based exam), as that is a better measure of student learning, and much easier to gather across all sections.

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

Students demonstrated more proficiency with the IPv6 addressing than the IPv4 addressing.

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.

We need to improve student performance in both IPv4 and IPv6 addressing. However, IPv4 seems to need much more improvement. The Variable Length

Subnet Masking is the most difficult topic in this outcome, and this analysis demonstrates that students need more practice with this topic. 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. I will be using only the Cisco final exams for future assessment. More details in the intended changes section.

Outcome 3: Build and configure a simple Ethernet network using routers and switches.

- Assessment Plan
    - Assessment Tool: Outcome-related questions on the Cisco final exam
    - Assessment Date: Fall 2020
    - Course section(s)/other population: All students
    - Number students to be assessed: All students
    - How the assessment will be scored: External evaluation
    - Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the outcome-related questions.
    - Who will score and analyze the data: The exam will be automatically graded by the Cisco Networking Academy server. The results will be analyzed by our full-time 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
52	29

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.

This is only my face-to-face and my DL section. I did not have access to the data for the sections that I did not teach. However, there is a plan in place to ensure I have this access for future assessment reports.

The information is housed at the Cisco Networking Academy site. Classes from previous semesters have already been archived. I do not have access to archived classes.

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 includes my day face-to-face section and my DL section.

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

This was the Cisco Networking Academy final exam. It is written and graded by the Cisco Networking Academy.

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: 86.6% met the standard of success for this outcome.

DL section: 94.4% met the standard of success for this outcome.

The standard of success was met.

I did not record student-by-student data and when I went back to check again, the exam had been archived. I will assess all sections and provide student-by-student data for future assessments.

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

The basic configuration tasks are shown to be the best areas of performance for these students.

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.

Configuring IPv4 and IPv6 addresses is an area that needs significant improvement. The most important consideration here is the determination/calculation of the addresses to configure. Students demonstrated the skill to properly use the correct commands to configure the addresses, but if they calculate the wrong address, then they configure the wrong address on the device interface. I will be using only the Cisco final exams for future assessment. More details in the intended changes section.

Outcome 4: Utilize common network utilities to verify small network operations and analyze data traffic.

- Assessment Plan
    - Assessment Tool: Outcome-related questions on the Cisco final exam
    - Assessment Date: Fall 2020
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: External evaluation
    - Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the outcome-related questions.
    - Who will score and analyze the data: The exam will be automatically graded by the Cisco Networking Academy server. The results will be analyzed by our full-time faculty.

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This includes my day face-to-face section and my DL section.

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

This was the Cisco Networking Academy final exam. It is written and graded by the Cisco Networking Academy.

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: 75.0% met the standard of success for this outcome.

DL section: 81.8% met the standard of success for this outcome.

The standard of success was met for this outcome.

I did not record student-by-student data and when I went back to check again, the exam had been archived. I will assess all sections and provide student-by-student data for future assessments.

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

Identifying the use/purpose of each tool seems to be a strength.

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.

Interpreting the results obtained by the tools, and then determining the steps to take to correct physical or logical configuration errors is a weakness. This troubleshooting is an area that needs improvement. I will be using only the Cisco final exams for future assessment. More details in the intended changes section.

Outcome 2: Design, calculate, and apply subnet masks and addresses to fulfill given requirements in internet protocol version 4 (IPv4) and IPv6 networks.

- Assessment Plan
    - Assessment Tool: Outcome-related questions on the Cisco final exam
    - Assessment Date: Fall 2020
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    - Number students to be assessed: All students
    - How the assessment will be scored: External evaluation
    - Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the outcome-related questions.
    - Who will score and analyze the data: The exam will be automatically graded by the Cisco Networking Academy server. The results will be analyzed by our full-time faculty.

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

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This was the Cisco Networking Academy final exam. It is written and graded by the Cisco Networking Academy.

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

There are two addressing schemes that students must master IPv4 and IPv6. The following results break down the student success for each of these addressing schemes.

The F2F section: 64.4% met the IPv6 outcome

59.8% met the IPv4 outcome

These students did not meet the standard of success for this outcome.

The DL section: 90.5% met the IPv6 outcome

92.3% met the IPv4 outcome

These students did meet the standard of success for this outcome.

This info was copied from the corresponding outcome tool results. These outcomes were assessed using only the Cisco exam, not a skills-based exam. The extra tool will be removed for future assessments.

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

Students demonstrated more proficiency with the IPv6 addressing than the IPv4 addressing.

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.

We need to improve student performance in both IPv4 and IPv6 addressing. However, IPv4 seems to need much more improvement. The Variable Length Subnet Masking is the most difficult topic in this outcome, and this analysis demonstrates that students need more practice with this topic. 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. I will be using only the Cisco final exams for future assessment. More details in the intended changes section.

Outcome 3: Build and configure a simple Ethernet network using routers and switches.

- Assessment Plan
    - Assessment Tool: Outcome-related questions/tasks on the Cisco skills-based final exam
    - Assessment Date: Fall 2020
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or higher
    - Who will score and analyze the data: Departmental faculty

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This includes my day face-to-face section and my DL section.

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

This was the Cisco Networking Academy final exam. It is written and graded by the Cisco Networking Academy.

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: 86.6% met the standard of success for this outcome. DL section: 94.4% met the standard of success for this outcome. The standard of success was met. This info was copied from the corresponding outcome tool results. These outcomes were assessed using only the Cisco exam, not a skills-based exam. The extra tool will be removed for future assessments.

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

The basic configuration tasks are shown to be the best areas of performance for these students.

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.

Configuring IPv4 and IPv6 addresses is an area that needs significant improvement. The most important consideration here is the determination/calculation of the addresses to configure. Students demonstrated the skill to properly use the correct commands to configure the addresses, but if they calculate the wrong address, then they configure the wrong address on the device interface. I will be using only the Cisco final exams for future assessment. More details in the intended changes section.

Outcome 4: Utilize common network utilities to verify small network operations and analyze data traffic.

- Assessment Plan
    - Assessment Tool: Outcome-related questions/tasks on the Cisco skills-based final exam
    - Assessment Date: Fall 2020
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or higher
    - Who will score and analyze the data: Departmental faculty

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

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This is only my face-to-face and my DL section. I did not have access to the data for the sections that I did not teach. However, there is a plan in place to ensure I have this access for future assessment reports. The information is housed at the Cisco Networking Academy site. Classes from previous semesters have already been archived. I do not have access to archived classes.

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 includes my day face-to-face section and my DL section.

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

This was the Cisco Networking Academy final exam. It is written and graded by the Cisco Networking Academy.

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
We did not assess this outcome using a skills-based exam. The skills-based exam will be removed for future assessments.

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

Identifying the use/purpose of each tool seems to be a strength.

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.

Interpreting the results obtained by the tools, and then determining the steps to take to correct physical or logical configuration errors is a weakness. This troubleshooting is an area that needs improvement.

I will be using only the Cisco final exams for future assessment. More details in the intended changes section.

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.

Unfortunately, we have no control over the final exam written by the Cisco Networking Academy. Therefore, we cannot add any questions to the final exam. We can however, better align our outcomes with the Cisco requirements.

I did add several demonstrations/examples and assignments this semester. Unfortunately, some topics still need improvement, such as IP addressing and troubleshooting.

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?

Overall this course is meeting the students' needs. However, there are a few areas that need improvement.

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

This information will be shared at a department meeting in the fall of 2023.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Outcome Language	Align our outcome language more closely with the Cisco Networking Academy outcome language.	Our current outcome language does not directly match the Cisco Networking Academy language. As a result, the data from the Academy site does not appear to directly align with our outcomes. If we do not align our language with Cisco's, we'll risk	2024

		being out-of-date. Further, this can be confusing for anyone not intimately familiar with the terminology/language.	
Assessment Tool	Remove skills assessment, assess the course with the written Cisco exam only.	The Cisco exam is a much stronger measurement of student learning. Also, the data is much easier to gather. The rate of return when considering the difficulty in gathering the data for the skills exam vs. the strength of the measurement of student learning is quite low. For this reason, assessing by exclusively using the written Cisco exam is a much more dependable and sustainable approach for future assessments. Further details on gathering the skills data for anyone interested: each skills assessment can provide a fair measurement of student ability on the skill in question, but there are too many skills taught during the semester to test all skills on one test. Such a test could take 8 to 10 hours for students to complete,	2023

		class time we cannot afford to lose. Consequently, these skills tests must be analyzed one at a time. Of course, these individual skills tests are a great indicator for instructors on what additional information needs to be provided, but not as much on overall understanding of the learning outcomes, which are much broader than what is covered in these myriad single-skill tests. Additionally, the difficulty of matching skills to outcomes and quantifying the student level of achievement of each is quite high, while the Cisco exam (upon which the learning outcomes are based anyway) is much clearer. As one example: it takes up to an hour to grade each student skill exam for CNT 226, because I must examine the configuration of each device in the network. With 20 to 30 students per class and 4 to 5 classes per semester, the grading of skills final exams is extremely time	

		consuming. The Cisco exam is a more accurate and less time-consuming measure of learning.	
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	I plan to create more assignments that train the students to use critical thinking.	One point that became clear during the final exams is that students were too accustomed to assignments that led them step by step. They lacked the ability to analyze problems and develop their own solutions.	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 actually teaching the class.	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 every section of every class at the Cisco Networking Academy site, to have access to the assessment data. 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	2023

		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.	

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

6.

III. Attached Files

CNT206 Course Assessment

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	206	CNT 206 05/15/2019-Internetworking I - Fundamentals
Division	Department	Faculty Preparer
Business and Computer Technologies	Computer Science & Information Technology	John Trame
Date of Last Filed Assessment Report		

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 all layers and functions of the OSI model.

- Assessment Plan
  - Assessment Tool: A departmental final exam will be used to assess understanding of key concepts.
  - Assessment Date: Fall 2006
  - Course section(s)/other population: All
  - Number students to be assessed: ~12 ~24 per semester
  - How the assessment will be scored:
  - Standard of success to be used for this assessment:

- Who will score and analyze the data:

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
61	42

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 in all four sections of this class who completed the Cisco online final exam were 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.

All students in all four sections of this class who completed the Cisco online final exam 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.

The final exam is written, administered, and graded online, by Cisco Systems Inc.

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
A total of 31 questions addressed this outcome. 30 of 42 students scored 70% or better on this set of questions. This can be found on the "Network Basics" sheet of the spreadsheet. This is a success rate of 71.43%.

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

The students met the success criteria 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.

We will continue to examine possible modifications to reach the ultimate goal of 100% success.

Outcome 2: Demonstrate how to connect a computer to the Internet and Local Area Networks.

- Assessment Plan
    - Assessment Tool: A departmental task list will be used to assess proficiency in applying the concepts and in performing hands-on tasks.
    - Assessment Date: Fall 2006
    - Course section(s)/other population: All
    - Number students to be assessed: ~12 ~24 per semester
    - How the assessment will be scored:
    - Standard of success to be used for this assessment:
    - Who will score and analyze the data:

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.

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61	42

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 in all four sections of this class who completed the Cisco online final exam were 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.

All students in all four sections of this class who completed the Cisco online final exam 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.

The final exam is written, administered, and graded online, by Cisco Systems Inc.

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

A total of 3 questions addressed this outcome.

23 of 42 students scored 70% or better on this set of questions.

This is a success rate of 54.76%.

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

The students met the success criteria 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.

More questions related to this outcome could provide greater insight into the students' abilities related to this outcome.

Outcome 3: Calculate binary, hexadecimal and decimal numbering system conversions.

- Assessment Plan
    - Assessment Tool:

- Assessment Date: Fall 2006
- Course section(s)/other population: All
- Number students to be assessed: ~12 ~24 per semester
- How the assessment will be scored:
- Standard of success to be used for this assessment:
- Who will score and analyze the data:

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
61	42

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 in all four sections of this class who completed the Cisco online final exam were 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.

All students in all four sections of this class who completed the Cisco online final exam 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.

The final exam is written, administered, and graded online, by Cisco Systems Inc.

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

A total of 11 or 14 questions addressed this outcome, depending on which version of the test a student received. 30 of 42 students scored 70% or better on this set of questions. This is a success rate of 71.43%.

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

The students met the success criteria 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.

We will continue to examine possible modifications to reach the ultimate goal of 100% success. More assignments may help improve student performance on this outcome.

Outcome 4: Identify networking terminology, bandwidth and networking models.

- Assessment Plan
  - Assessment Tool:
  - Assessment Date: Fall 2006
  - Course section(s)/other population: All
  - Number students to be assessed: ~12 ~24 per semester
  - How the assessment will be scored:
  - Standard of success to be used for this assessment:
  - Who will score and analyze the data:

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

61	42

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 in all four sections of this class who completed the Cisco online final exam were 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.

All students in all four sections of this class who completed the Cisco online final exam 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.

The final exam is written, administered, and graded online, by Cisco Systems Inc.

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
A total of 5 questions addressed this outcome. 31 of 42 students scored 70% or better on this set of questions. This is a success rate of 73.81%.

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

The students met the success criteria 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.

We will continue to examine possible modifications to reach the ultimate goal of 100% success.

Outcome 5: Identify copper, optical and wireless mediums and the relationship between signals and noise.

- Assessment Plan
    - Assessment Tool:
    - Assessment Date: Fall 2006
    - Course section(s)/other population: All
    - Number students to be assessed: ~12 ~24 per semester
    - How the assessment will be scored:
    - Standard of success to be used for this assessment:
    - Who will score and analyze the data:

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
61	42

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 in all four sections of this class who completed the Cisco online final exam were 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.

All students in all four sections of this class who completed the Cisco online final exam 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.

The final exam is written, administered, and graded online by Cisco Systems Inc.

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
A total of 31 questions addressed this outcome. 30 of 42 students scored 70% or better on this set of questions. This is a success rate of 71.43%.

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

The students met the success criteria 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.

We will continue to examine possible modifications to reach the ultimate goal of 100% success.

Outcome 6: Demonstrate how to cable a Local Area Network.

- Assessment Plan
    - Assessment Tool:
    - Assessment Date: Fall 2006
    - Course section(s)/other population: All
    - Number students to be assessed: ~12 ~24 per semester
    - How the assessment will be scored:
    - Standard of success to be used for this assessment:
    - Who will score and analyze the data:

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
61	42

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 in all four sections of this class who completed the Cisco online final exam were 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.

All students in all four sections of this class who completed the Cisco online final exam 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.

A hands-on skills based final exam was used to measure the success of 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
All 42 students demonstrated the ability to connect appropriate cables between devices.

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

The students met the success criteria 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.

We will continue to examine possible modifications to reach the ultimate goal of 100% success.

Outcome 7: Identify networking fundamentals and operations to include broadcast domains and collision domains.

- Assessment Plan
    - Assessment Tool:
    - Assessment Date: Fall 2006
    - Course section(s)/other population: All
    - Number students to be assessed: ~12 ~24 per semester
    - How the assessment will be scored:
    - Standard of success to be used for this assessment:
    - Who will score and analyze the data:

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
61	42

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 in all four sections of this class who completed the Cisco online final exam were 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.

All students in all four sections of this class who completed the Cisco online final exam 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.

The final exam is written, administered, and graded online, by Cisco Systems Inc.

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
A total of 31 questions addressed this outcome. 30 of 42 students scored 70% or better on this set of questions. This is a success rate of 71.43%.

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

The students met the success criteria 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.

We will continue to examine possible modifications to reach the ultimate goal of 100% success. Greater insight into which specific terms need further explanation would require much more analysis of each specific question.

Outcome 8: Demonstrate TCP and IP address relationships, to include subnetting.

- Assessment Plan
    - Assessment Tool:
    - Assessment Date: Fall 2006
    - Course section(s)/other population: All
    - Number students to be assessed: ~12 ~24 per semester
    - How the assessment will be scored:
    - Standard of success to be used for this assessment:
    - Who will score and analyze the data:

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
61	42

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 in all four sections of this class who completed the Cisco online final exam were 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.

All students in all four sections of this class who completed the Cisco online final exam 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.

The final exam is written, administered, and graded online by Cisco Systems Inc.

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

A total of 14 questions addressed this outcome.

30 of 42 students scored 70% or better on this set of questions.

This is a success rate of 71.43%.

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

The students met the success criteria 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.

We will continue to examine possible modifications to reach the ultimate goal of 100% success. More homework and in-class assignments could help improve student performance.

Outcome 9: Identify the differences between routed and routing protocols.

- Assessment Plan
    - Assessment Tool:
    - Assessment Date: Fall 2006
    - Course section(s)/other population: All
    - Number students to be assessed: ~12 ~24
    - How the assessment will be scored:
    - Standard of success to be used for this assessment:
    - Who will score and analyze the data:

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
61	42

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 in all four sections of this class who completed the Cisco online final exam were 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.

All students in all four sections of this class who completed the Cisco online final exam 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.

The final exam is written, administered, and graded online, by Cisco Systems Inc.

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
A total of 3 questions addressed this outcome. 19 of 42 students scored 70% or better on this set of questions. This is a success rate of 45.24%.

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

The students met the success criteria 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.

We will continue to examine possible modifications to reach the ultimate goal of 100% success. More questions related to this outcome could provide better insight into student success with this outcome. Three questions do not provide enough data to analyze.

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.

I did not see a previous report.

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 overall results of the Final Concepts Exam were:

33 of 42 students scored 70% or better on the final exam. The success rate was 78.57% Overall, this course is meeting its intended goal. There were no surprises in these results.

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

This information will be shared with the department in a department meeting.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Assessment Tool	Add outcome-specific questions to assessment tools.	More questions pertaining to the identified outcomes would improve the quantity of data collected, which could provide more significant analysis of student performance.	2020
Course Assignments	Add more practice/assignments related to all outcomes, and especially related to number systems, IP Addressing and cabling (which seem to need the most improvement).	Additional practice with these concepts will improve student performance.	2020

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

6.

III. Attached Files

CNT206-Assessment-W2019-v2

Faculty/Preparer:	John Trame	**Date:** 05/30/2019
Department Chair:	Philip Geyer	**Date:** 06/04/2019
Dean:	Eva Samulski	**Date:** 06/05/2019
Assessment Committee Chair:	Shawn Deron	**Date:** 09/10/2019

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Computer Networking Technology	206	CNT 206 11/21/2016- Introduction to Networks
Division	Department	Faculty Preparer
Business and Computer Technologies	Computer Instruction	James Lewis
Date of Last Filed Assessment Report		

I. Assessment Results per Student Learning Outcome

Outcome 1: Identify the devices and services used to support communications in data networks and the Internet

- Assessment Plan
    - Assessment Tool: Online multiple choice final exam written by Cisco Systems
    - Assessment Date: Fall 2016
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: External evaluation
    - Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the final exam.
    - Who will score and analyze the data: The exam will be automatically graded by the Cisco Networking Academy server. The results will be analyzed by our full-time 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)
2016		

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

# of students enrolled	# of students assessed
34	19

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.

Full class, 19 students, full assessment of students in my course only. For next assessment, arrangements will be made to collect data from both sections.

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 section is F2F students, 100% of class.

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

Used Cisco designed questions that I selected from pool. Students were presented with various devices and were required to identify their role. Answer key was used to score the test questions.

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
All students correctly answered the five outcome related questions. This exceeded the standard of success established 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 did very well against this outcome. This is a very basic concept so expectation was that all would meet objective.

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.

To improve this objective, it should be revised to reflect a more challenging perception of networking. Reinstate a more focused and comprehensive objective that demonstrates actual student skills as opposed to student recalling terms and concepts.

Outcome 2: Recognize the role of protocol layers in data networks

- Assessment Plan
    - Assessment Tool: Online multiple choice final exam written by Cisco Systems
    - Assessment Date: Fall 2016
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: External evaluation
    - Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the final exam.
    - Who will score and analyze the data: The exam will be automatically graded by the Cisco Networking Academy server. The results will be analyzed by our full-time 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)
2016		

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

# of students enrolled	# of students assessed
34	19

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.

Full class, 19 students, full assessment of students in my course only. For next assessment, arrangements will be made to collect data from both sections.

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 section is F2F students, 100% of class.

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

Used Cisco designed questions that I selected from pool. Students were presented with various devices and were required to identify their role. Answer key was used to score the test questions.

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
5% of the students (1) scored 70% or higher on the outcome related questions. This does not meet the standard of success established 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 who did not have a traditional prerequisite course material all failed this objective significantly. Other students who had prerequisite course material did better, however, did not meet objectives. We spent an increased amount of time with remedial concepts that the course flow was sluggish.

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.

Reinstate CST 225 and the course pre-assessment test that we used to provide before this course was revised to accommodate online student population. See student comments in attached file.

Outcome 3: Recognize addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments.

- Assessment Plan
    - Assessment Tool: Online multiple choice final exam written by Cisco Systems
    - Assessment Date: Fall 2016
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: External evaluation

- Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the final exam.
- Who will score and analyze the data: The exam will be automatically graded by the Cisco Networking Academy server. The results will be analyzed by our full-time 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)
2016		

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

# of students enrolled	# of students assessed
34	19

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.

Full assessment 19/19.

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.

F2F

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

The outcome was not assessed. The outcome needs to be rewritten.

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
Could not assess.

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

Did not assess.

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.

Remove this outcome and replace with something more focused on in-depth comprehension of networking concepts.

Outcome 4: Design, calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 networks.

- Assessment Plan
    - Assessment Tool: Skills based assessment test
    - Assessment Date: Fall 2016
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or higher
    - 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)
2016		

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

# of students enrolled	# of students assessed
34	19

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.

Full assessment of my section only. Arrangements will be made in the future to acquire data from all sections.

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 section was F2F.

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

Provided subnet mask information and address class and students had to determine address range, first and last host address, and broadcast address based on this information. Scored in-class assignment.

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
7/19 students (36.8%) correctly answered these outcome related questions. Students could answer either correctly or incorrectly all three questions. Therefore the results is the standards of success was actually 70% of the students would score 100%. This standard was not met.

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

Student success was distributed and not even across students. A significant amount of time was spent in remedial concepts of numbering systems, IP addressing and subnetting. More time was spent on understanding IP addressing and numbering systems in this class, than any previous class I have taught in this course.

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.

Reinstate CST 225 and the course pretest we used to administer before this course was reconstructed to accommodate online population.

Outcome 4: Design, calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 networks.

- Assessment Plan

- Assessment Tool: Online multiple choice final exam written by Cisco Systems
- Assessment Date: Fall 2016
- Course section(s)/other population: All sections
- Number students to be assessed: All students
- How the assessment will be scored: External evaluation
- Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the final exam.
- Who will score and analyze the data: The exam will be automatically graded by the Cisco Networking Academy server. The results will be analyzed by our full-time 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)
2016		

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

# of students enrolled	# of students assessed
34	19

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.

Full assessment 19/19. This outcome was not assessed with this tool.

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.

F2F

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

The outcome was not assessed using this tool. The outcome needs to be rewritten.

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
Could not assess.

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

Student success was distributed and not even across students. A significant amount of time was spent in remedial concepts of numbering systems, IP addressing and subnetting. More time was spent on understanding IP addressing and numbering systems in this class, than any previous class I have taught in this course.

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.

Reinstate CST 225 and the course pretest we used to administer before this course was reconstructed to accommodate online population.

Outcome 5: Identify and recognize fundamental Ethernet concepts, such as media, services, and operations.

- Assessment Plan
    - Assessment Tool: Online multiple choice final exam written by Cisco Systems
    - Assessment Date: Fall 2016
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: External evaluation
    - Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the final exam.
    - Who will score and analyze the data: The exam will be automatically graded by the Cisco Networking Academy server. The results will be analyzed by our full-time 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)

2016		

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

# of students enrolled	# of students assessed
34	19

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 in my section were assessed. In the future, data from all sections will be acquired.

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 section was F2F.

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

Written exam based on Cisco test questions.

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
17/19 were successful (89.4%). Students were required to answer all questions correctly in order to get credit.

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

The outcomes for this objective are basic and it is expected that all students should be successful.

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.

Reinstate a more focused and comprehensive objective that demonstrates actual student skills as opposed to student recalling terms and concepts.

Outcome 6: Build a simple Ethernet network using routers and switches.

- Assessment Plan
    - Assessment Tool: Skills based assessment test
    - Assessment Date: Fall 2016
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or higher
    - 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)
2016		

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

# of students enrolled	# of students assessed
34	19

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.

I assessed my section of this course. 19 of 19 students. In the future, data from all sections will be acquired.

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.

My section is F2F.

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

This was a hands-on project in class. Scored as pass/fail (network must be fully functional to pass).

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
17/19 were successful (89.4%). This meets 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 performed typically for a F2F class in this material. Strength in this objective was demonstrated by repetition of hands-on building and configuration of 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.

Plans are to maintain the required hands-on exercises for this objective.

Outcome 6: Build a simple Ethernet network using routers and switches.

- Assessment Plan
    - Assessment Tool: Online multiple choice final exam written by Cisco Systems
    - Assessment Date: Fall 2016
    - Course section(s)/other population: All students
    - Number students to be assessed: All students
    - How the assessment will be scored: External evaluation
    - Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the final exam.
    - Who will score and analyze the data: The exam will be automatically graded by the Cisco Networking Academy server. The results will be analyzed by our full-time 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)
2016		

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

# of students enrolled	# of students assessed
34	19

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.

Full assessment 19/19. This outcome was not assessed with this tool.

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.

F2F

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

The outcome was not assessed using this tool. The outcome needs to be rewritten.

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
Could not assess.

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

Students performed typically for a F2F class in this material. Strength in this objective was demonstrated by repetition of hands-on building and configuration of 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.

Plans are to maintain the required hands-on exercises for this objective.

Outcome 7: Use Cisco command-line interface (CLI) commands to perform basic router and switch configurations.

- Assessment Plan
    - Assessment Tool: Skills based assessment test
    - Assessment Date: Fall 2016
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or higher
    - 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)
2016		

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

# of students enrolled	# of students assessed
34	19

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.

Full class, 19 students, full assessment of students in my course only. For next assessment, arrangements will be made to collect data from both sections.

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 section is F2F students, 100% of class.

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

Used Cisco designed questions that I selected from pool. Students were presented with various devices and were required to identify their role. Answer key was used to score the test questions.

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
All students correctly answered the five outcome related questions. This exceeded the standard of success established for this outcome.

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

Strength in this objective was demonstrated by repetition of using the command line in hands-on exercises.

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.

Plans are to maintain the required hands-on exercises for this objective.

Outcome 7: Use Cisco command-line interface (CLI) commands to perform basic router and switch configurations.

- Assessment Plan
    - Assessment Tool: Online multiple choice final exam written by Cisco Systems.
    - Assessment Date: Fall 2016
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: External evaluation
    - Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the final exam.
    - Who will score and analyze the data: The exam will be automatically graded by the Cisco Networking Academy server. The results will be analyzed by our full-time 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)

2016		

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

# of students enrolled	# of students assessed
34	19

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.

Full assessment 19/19. This outcome was not assessed with this tool.

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.

F2F

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

The outcome was not assessed using this tool. The outcome needs to be rewritten.

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
Could not assess.

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

Strength in this objective was demonstrated by repetition of using the command line in hands-on exercises.

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.

Plans are to maintain the required hands-on exercises for this objective.

Outcome 8: Utilize common network utilities to verify small network operations and analyze data traffic.

- Assessment Plan
    - Assessment Tool: Skills based assessment test
    - Assessment Date: Fall 2016
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or higher
    - 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)
2016		

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

# of students enrolled	# of students assessed
34	19

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.

I assessed my section only. Full class, 19 of 19 students. In the future, data from all sections will be included in the 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 section is F2F.

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

Used common network monitoring tools in a live environment including Wireshark, Putty, nslookup, traceroute and ping.

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
19/19 were successful. 100% of the students met 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 performed typically for a F2F class in this material. Strength in this objective was demonstrated by repetition of hands-on monitoring and configuration of 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.

Plans are to maintain the required hands-on exercises for this objective.

Outcome 8: Utilize common network utilities to verify small network operations and analyze data traffic.

- Assessment Plan
    - Assessment Tool: Online multiple choice final exam written by Cisco Systems
    - Assessment Date: Fall 2016
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: External evaluation
    - Standard of success to be used for this assessment: At least 70% of the students will score 70% or better on the final exam.
    - Who will score and analyze the data: The exam will be automatically graded by the Cisco Networking Academy server. The results will be analyzed by our full-time faculty.

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

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2016		

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

# of students enrolled	# of students assessed
34	19

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.

Full assessment 19/19. This outcome was not assessed with this tool.

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.

F2F

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

The outcome was not assessed using this tool. The outcome needs to be rewritten.

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
Could not assess.

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

Students performed typically for a F2F class in this material. Strength in this objective was demonstrated by repetition of hands-on monitoring and configuration of 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.

Plans are to maintain the required hands-on exercises for this objective.

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?

Students that had prerequisite skills performed typically against previous students in this same course. Since the prerequisites have been removed from this course, students who did not complete the prerequisite courses or have relevant experience are not performing well.

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

This information has been presented in department discussions.

3. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Outcome Language	Revise outcome language for the outcomes that coul not be assessed.	Outcome language needs to be measurable and reflect the key areas of the course.	2018
Pre-requisite	Reinstate CST 225 and the course pre-assessment test.	CST 225 was removed as a prerequisite to accommodate the online student population. The assessment results support the conclusion that students who did not have CST 225 as a prerequisite were less successful than those who did have the prerequisite. This was further supported by a survey of students attached to the report.	2018

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

All students that did not have the traditional prerequisite course material (CST 225 or industry experience) failed the final exam.

III. Attached Files

OSI Model Options
OSI Model Template
Student Comments

Faculty/Preparer:	James Lewis	**Date:** 01/18/2017
Department Chair:	Philip Geyer	**Date:** 02/27/2017
Dean:	Kimberly Hurns	**Date:** 03/03/2017
Assessment Committee Chair:	Ruth Walsh	**Date:** 03/26/2017