Discipline	Course Number	Title
Computer Networking Technology	290	CNT 290 06/28/2021- Network Forensics
College	Division	Department
Business and Computer Technologies	Business and Computer Technologies	Computer Science & Information Technology
Faculty Preparer		James Lewis
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: Build and configure complex network environments and services with monitoring capabilities to include LAN, WAN, enterprise, remote, VoIP and wireless configurations.

- Assessment Plan

  - Assessment Tool: A final hands-on assignment

  - Assessment Date: Winter 2016

  - Course section(s)/other population: All classes during winter term

  - Number students to be assessed: All

  - How the assessment will be scored: Departmentally-developed rubric.

- o Standard of success to be used for this assessment: 75% of the students will score 75% or higher on the project.

- o 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)
	2021	

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

# of students enrolled	# of students assessed
16	15

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.

The difference between assessed and enrolled is due to lack of attendance by a student.

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.

Only the evening section was assessed. No other sections were offered.

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

Students were to build a final network based on previous modules, configure it for monitoring capability, then collect and analyze traffic information from the network while in use.

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

This specific outcome was illustrated and explained during lecture presentation. Due to covid-19 restrictions, students did not have access to a complete laboratory environment. It is anticipated that this was an isolated occurrence.

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

> This is a difficult aspect of the assessment to report because all classroom / lecture / lab activity was delivered virtually. Most of the students demonstrated understanding of the material during lecture and at home exercises; however, it was difficult to determine the level of comprehension for those students who did not communicate during class time. The only thing I had to assess during these situations was whether they submitted a completed exercise or assignment.

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.

> Student achievement can be improved with actual networks to build, conduct monitoring and analyze. This will be improved with availability of live equipment. Continuous improvement in this profession is constant. New tools, techniques, methodologies, etc. are being released every day and those that pertain to the profession of network forensics are and will be incorporated in future deliveries.

Outcome 1: Build and configure complex network environments and services with monitoring capabilities to include LAN, WAN, enterprise, remote, VoIP and wireless configurations.

- Assessment Plan

  - o Assessment Tool: Departmentally-developed written exam

  - o Assessment Date: Winter 2017

  - o Course section(s)/other population: All sections

  - o Number students to be assessed: All students

  - o How the assessment will be scored: Answer Key

  - o Standard of success to be used for this assessment: 75% of students will score 75% or higher on the exam.

  - o 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)
	2021	

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

# of students enrolled	# of students assessed
16	15

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.

> 15 students were included in the assessment count due to one student not attending.

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.

> One section was assessed, the evening section. No other sections were offered.

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

> This outcome could not be adequately assessed due to covid-19 restrictions. A fully configured local area network is required for completion.

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
>
> Data could not be collected for this written exam due to changes needed to accommodate teaching online. The test questions were based on configuring a LAN on a live network which students could not access. Additional assignments were used to deliver the content but the other evaluation methods didn't result in the needed data.

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

> This is a difficult aspect of the assessment to report because all classroom / lecture / lab activity was delivered virtually. Most of the students demonstrated understanding of the material during lecture and at home exercises; however, it was difficult to determine the level of comprehension for those students who did not communicate during class time. The only thing I had to assess during these situations was whether they submitted a completed exercise or assignment.

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.

> Student achievement can be improved with actual networks to build, conduct monitoring and analyze. This will be improved with availability of live equipment. Continuous improvement in this profession is constant. New tools, techniques, methodologies, etc. are being released every day and those that pertain to the profession of network forensics are and will be incorporated in future deliveries.

Outcome 2: Monitor and analyze a network and perform after-event analysis of a network attack and determine if it was successful, where it originated, and the consequences to the target system or device.

- Assessment Plan

  o Assessment Tool: A final hands-on assignment

  o Assessment Date: Winter 2016

  o Course section(s)/other population: All classes during winter term

  o Number students to be assessed: All

  o How the assessment will be scored: Departmentally-developed rubric.

  o Standard of success to be used for this assessment: 75% of the students will score 75% or higher on the project.

  o 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)
	2021	

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

# of students enrolled	# of students assessed
16	13

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 were not assessed due to lack of attendance. One student did not submit any responses to 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.

Only the evening section was assessed. There were no other sections offered.

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

Assessment was conducted by providing the students with the topology of a complex enterprise network. Students were then provided with packet capture files (.pcap) from various parts of the network and they were asked to forensically examine each .pcap file and identify where in the network it originated.

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

12 students successfully identified the correct originating locations of each provided .pcap file.

One student received 1/2 success rating on this assessment.

One student did not submit the response to the assessment and received a 0.

Two students failed this assessment due to lack of attendance.

12/13 (92.3%) of the students were completely successful in this specific assessment.

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

Students overall did exceptionally well with forensic analysis of capture network traffic in a virtual environment. This was made possible with the provision of captured data by the instructor. Although the students were provided with instructor packet captures, this did give them the advantage of being able to focus more on their analysis as opposed to the tasks needed to set up monitoring methods and techniques. The majority of the students demonstrated that they could adapt to acquiring their own traffic captures in a relatively short period of time if they understood what they are supposed to do with them once they get them. Overall they demonstrated that during the class and final assessment.

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.

> Achievement of this learning outcome will be improved by virtue of a live network to work with. Continuous improvement in this profession is a requirement because new tools, techniques and methods are being released each day and will be incorporated in future courses and materials.

Outcome 2: Monitor and analyze a network and perform after-event analysis of a network attack and determine if it was successful, where it originated, and the consequences to the target system or device.

- Assessment Plan

    o Assessment Tool: Departmentally-developed written exam

    o Assessment Date: Winter 2017

    o Course section(s)/other population: All sections

    o Number students to be assessed: All students

    o How the assessment will be scored: Answer Key

    o Standard of success to be used for this assessment: 75% of students will score 75% or higher on the exam.

    o 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)
	2021	

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

# of students enrolled	# of students assessed
16	13

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.

> One student stopped attending class early in the term. Two students were absent on the day of 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.

Only one section was offered, the evening section.

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 a document for the student to answer questions specifically pertaining to their forensic analysis of the .pcap files they were provided for the hand-on portion of their final examination. There were five .pcap files analyzed.

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

This outcome was assessed virtually as the students did not have access to a live network due to covid-19 restrictions. This was an acceptable substitution for a live environment in view of the circumstances.

13 students were assessed.

12/13 students (92.3%) were 100% accurate in their forensic examination of provided .pcap files

2 students were absent.

1 student received 1/2 credit.

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

Students overall did exceptionally well with forensic analysis of capture network traffic in a virtual environment. This was made possible with the provision of captured data by the instructor. Although the students were provided with instructor packet captures, this did give them the advantage of being able to focus more on their analysis as opposed to the tasks needed to set up monitoring methods and techniques. The majority of the students demonstrated that they could adapt to acquiring their own traffic captures in a relatively short period of time if they understood what they are supposed to do with them once they get them. Overall they demonstrated that during the class and final assessment.

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.

> Achievement of this learning outcome will be improved by virtue of a live network to work with. Continuous improvement in this profession is a requirement because new tools, techniques and methods are being released each day and will be incorporated in future courses and materials.

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.

> No previous report available. This is the first time this course has been offered.

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?

> This could not be accurately assessed due to the course being designed for a F2F laboratory environment, however, the intensity of this course brought to light to the students the knowledge depth in networking as many students acknowledged.

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 faculty in the department.

4.
Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	Three of the current 21 modules will be revised. One module will include a new forensic analysis tool with demonstrations.	This is the first time this course has been offered in this format. The above enhancements are the results of lessons learned.	2021

	One module will include a new simple topology as an introduction to network topologies. This is to ease the student into more complex topologies for advanced monitoring and analysis. One module will revise the packet capture files (.pcap) to be more suitable to the type of forensic analysis.		

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

6.

III. Attached Files

[CNT 290 Assessment Data](#)
[CNT 290 Assessment](#)

Faculty/Preparer: James Lewis **Date:** 07/08/2021
Department Chair: Cyndi Millns **Date:** 07/12/2021
Dean: Eva Samulski **Date:** 07/15/2021
Assessment Committee Chair: Shawn Deron **Date:** 10/28/2021