

Program: Cybersecurity and Computer Networks

Degree: Associate in Applied Science

Program Learning Outcomes:

1. Students will understand and implement IP addressing within small, medium, and large networks.
2. Students will configure and troubleshoot networking equipment to support communication requirements.
3. Students will implement, manage, and maintain operating systems for computing and network devices.
4. Students will understand data and how it is stored, as well as the hardware/software used to access and process it.
5. Students will identify security-related threats and implement appropriate measures to protect networked devices from them.
6. Students will employ established best practices for securing the devices in a network infrastructure.
7. Students will understand key concepts and terminology relating to cybersecurity.

Assessment Cycle:

	AY 2017-2018	AY 2018-2019	AY 2019-2020	AY 2020-2021
Outcome #1	A CIS 267 Fall 2017	R	A CIS 267 Fall 2019	R
Outcome #2	R	A CS 268 Spring 2019	R	A CS 268 Spring 2021
Outcome #3	A CIS 212 Fall 2017	R	A CIS 212 Fall 2019	R
Outcome #4	R	A CIS 128 Fall 2018 CIS 204 Fall 2018	R	A CIS 128 Fall 2020 CIS 204 Fall 2020
Outcome #5	A CIS 255 Spring 2018	R	A CIS 255 Spring 2020	R
Outcome #6	R	A CIS 255 Spring 2019	R	A CIS 255 Spring 2021
Outcome #7	A CIS 147 Fall 2017	R	A CIS 147 Fall 2019	R
IELO	R	A ????	R	A ????

A = Assessment evidence collected

R = Reflect on data, action plan devised, prep year

Program Curriculum Map

	Semester Offered	PROGRAM LEARNING OUTCOMES							IELO
		#1	#2	#3	#4	#5	#6	#7	Problem Solving
CIS 105	Fall/Spring				X				
CIS 128	Fall/Spring				X, A				
CIS 147	Fall					X	X	X, A	
CIS 164	Fall/Spring	X	X	X					
CIS 212	Fall			X, A			X		
CIS 230	Fall/Spring				X				
CIS 107	Fall/Spring			X					
CIS 165	Spring	X	X	X					
CIS 216	Spring			X			X		
CIS 255	Spring					X, A	X, A	X	
CIS 204	Fall				X, A				
CIS 214	Fall			X			X		
CIS 223	Fall			X			X		
CIS 241	Fall				X	X	X	X	
CIS 267	Fall	X, A	X	X			X		
CIS 213	Spring			X			X		
CIS 226	Spring			X		X	X		
CIS 268	Spring	X	X, A	X			X		
CIS 269 or 197/297	Spring								
CIS 282	Spring					X	X	X	
ENGL 110	Fall/Spring								
CSCI 122 or 160	Fall/Spring				X				
COMM 110 or ENGL 125	Fall/Spring								
MATH 210	Fall/Spring				X				
PHIL 220	Fall/Spring				X				

X = Material introduced, reinforced, and/or opportunity to practice

A = Assessment evidence collected (e.g., lab activity, exam, paper, assignment, etc.)

Section I: Program Learning Outcomes

The first three columns of the table (*Program Learning Outcomes*, *Assessment Methods/Measures*, and *Intended Results*) represent your assessment plan. Complete this portion at the beginning of the academic year. The final two columns of the table (*Results* and *Action Plan/Follow-Up to Improve Student Learning*) can be completed after data collection has occurred.

Assessment Methods/Measures: Choose assessment methods (e.g., projects, activities, exam questions, assignments, etc.) that are relevant and appropriate for your courses and program and best inform you about the strengths and weaknesses in student learning.

Intended Results: For each assessment, state a benchmark or target for student achievement. Keep expectations for student learning high, but attainable.

Results: Summarize the data you have collected and describe what the data have shown you. Sophisticated or complicated data analysis techniques are not necessary; just share what the data are telling you. Include both numbers and percentages whenever possible in order to tell a more complete story (e.g., "48% of the 64 students assessed...").

Action Plan/Follow-Up to Improve Student Learning: Describe any changes or decisions you have made based on the analysis of your data. Changes can be small or big. In some cases, you may not want to make any changes until you have collected enough longitudinal data to show that the issue you have identified is consistent. In other cases, your students may be doing well on the assessment and you may not need to change your course for that particular outcome. If you decide not to make any changes or decide to make changes to your assessments or benchmarks instead of your course, explain why you have made that decision.

Assessment Report

Program Learning Outcomes <i>What are the expected program learning outcomes? What will students be able to think, know, do, or feel because of a given educational experience?</i>	Assessment Methods / Measures <i>What are you going to do? How and when (i.e., during which semester(s) and academic year) will the data be collected? What students will be assessed?</i>	Intended Results <i>What is the performance target or benchmark for the assessment? What is your intended action plan? What assumptions do you have?</i>	Results <i>What were the actual results?</i>	Action Plan / Follow-Up to Improve Student Learning <i>What changes and/or decisions were made after reviewing the results? How will you follow up to measure improvement?</i>
1. Students will understand and implement IP addressing within small, medium, and large networks.	CIS 267 – Hands-On Subnetting Assignment Fall 2017	All students receive a 72% or better	16 of 18 students met the goal 2 students did not complete the work	Will evaluate methods for improving student subnetting comprehension.
2. Students will configure and troubleshoot networking equipment to support communication requirements.	Not assessed in AY 2017-2018	All students receive a 72% or better	N/A	N/A
3. Students will implement, manage, and maintain operating systems for computing and network devices.	CIS 212 – Windows 10 Imaging Lab (RP Lab) Fall 2017	All students receive an 72% or better	19 of 29 students met the goal	Lab will be started together in class with the remainder left up to the student. Ask Questions on the test regarding student piece to measure improvement.
4. Students will understand data and how it is stored, as well as the hardware/software used to access and process it.	Not assessed in AY 2017-2018	All students receive a 72% or better	N/A	N/A

Assessment Report

<p>5. Students will identify security-related threats and implement appropriate measures to protect networked devices from them.</p>	<p>CIS 255 – Hands-On Network Defenses Assignment Spring 2018</p>	<p>All students receive a 72% or better</p>	<p>21 of 31 students met the goal 10 students did not complete the work</p>	<p>Evaluate whether to move the assignment to a later date in the class, when students have a better understanding of the network defense material.</p>
<p>6. Students will employ established best practices for securing the devices in a network infrastructure.</p>	<p>Not assessed in AY 2017-2018</p>	<p>All students receive a 72% or better</p>	<p>N/A</p>	<p>N/A</p>
<p>7. Students will understand key concepts and terminology relating to cybersecurity.</p>	<p>CIS 147 – Final Test Fall 2017</p>	<p>Students should be able to achieve a B (82%) or higher on this exam. Exam is rated as easy and is a review of the key concepts and terms during the semester.</p>	<p>13 out of 15 students achieved an 82% or higher. 1 students scored a 62% (D) and the other scored a 77% (C)</p>	<p>No change needed, students understand the key concepts and terminology. Reinforcement and broadening of these concepts and terms can be done through the use of hands on activities next time around.</p>

Section II: Institutional Essential Learning Outcome

Identify the Institutional Essential Learning Outcome tied to your program and complete the corresponding section(s) of the table for the Institutional Essential Learning Outcome that you are evaluating at this time. Keep in mind that a single course or program cannot and is not expected to meet all of the Institutional Essential Learning Outcomes. However, each program is expected to contribute to at least one Institutional Essential Learning Outcome.

The first three columns of the table (Institutional Essential Learning Outcome, Assessment Methods/Measures, and Intended Results) represent your assessment plan. Complete this portion at the beginning of the academic year. The final two columns of the table (Results and Action Plan/Follow-Up to Improve Student Learning) can be completed after data collection has occurred.

Assessment Methods/Measures: Choose assessment methods (e.g., projects, activities, exam questions, assignments, etc.) that are relevant and appropriate for your program and best inform you about the strengths and weaknesses in student learning.

Intended Results: For each assessment, state a benchmark or target for student achievement. Keep expectations for student learning high, but attainable.

Results: Summarize the data you have collected and describe what the data have shown you. Sophisticated or complicated data analysis techniques are not necessary; just share what the data are telling you. Include both numbers and percentages whenever possible in order to tell a more complete story (e.g., "48% of the 64 students assessed...").

Action Plan/Follow-Up to Improve Student Learning: Describe any changes or decisions you have made based on the analysis of your data. Changes can be small or big. In some cases, you may not want to make any changes until you have collected enough longitudinal data to show that the issue you have identified is consistent. In other cases, your students may be doing well on the assessment and you may not need to change your course for that particular IELO. If you decide not to make any changes or decide to make changes to your assessments or benchmarks instead of your course, explain why you have made that decision.

Assessment Report

Institutional Essential Learning Outcome	Assessment Methods / Measures <i>What are you going to do? How and when (i.e., during which semester(s) and academic year) will the data be collected? What students will be assessed?</i>	Intended Results <i>What is the performance target or benchmark for the assessment? What is your intended action plan? What assumptions do you have?</i>	Results <i>What were the actual results?</i>	Action Plan / Follow-Up to Improve Student Learning <i>What changes and/or decisions were made after reviewing the results? How will you follow up to measure improvement?</i>
Problem Solving				
Define Problem	Students complete a Malware Cleanup lab where they must identify the Malware, develop a plan of action to clean it up, implement the plan, and document their findings and strategy	Students should be able to achieve a 2 on a 0-4 scale for each category this activity. Rubric in blackboard used to assess. Categories: Evaluate Outcomes Implement Strategy Identify Plan Define Problem	14 out of 15 scored a 2 or higher for defining a problem. 1 scored a 1.	The results show that the students can identify the problem and develop a plan. The struggle to carry out the plan and evaluate the results though. Based on this, more time will be spent on how to effectively cleanup malware and determine if the system is cleaned after going through the process.
Identify Approach/Strategies/Plan			12 scored a 2 or higher for identifying a strategy. 3 scored a 1.	
Implement Strategy			10 of 15 scored a 2 or higher for implementing strategy. 5 scored a 1.	
Evaluate Outcomes			8 of 15 students scored a 2 or higher for Evaluate Outcomes. The remaining 7 scored a 1.	

Assessment Report

Important Reminder:

All of the selected Institutional Essential Learning Outcome needs to be integrated and assessed in your program. If there is a criterion (each row of the rubric and table above represents a criterion) of an Institutional Essential Learning Outcome that does not fit with your program content, curriculum, and the student learning that takes place, you may exclude one. If you do exclude a criterion, you must indicate which criterion you are excluding and the justification as to why below.

Please list the IELO you are assessing at this time and the criterion you excluded.

Problem solving

Why did you exclude this criterion? How is this criterion not applicable to your program?

None excluded

Section III: Analysis of Assessment Data

How did your program support BSC's Institutional Essential Learning Outcomes? Explain.

In our program students are required to solve problems all the time. They need to critically think through the problem and develop a plan to fix it. Our program is a great fit for this IELO. Throughout the program students learn a process of problem solving are then asked to apply it to a variety of situations.

How was student learning affected through this assessment cycle? What did you learn during the process?

Student results were right on par for what we expected. This showed us that students were able to figure out this particular problem they were presented with. We learned that if we go in depth into a certain scenario that students can complete and solve the problem. We believe that we should also assess a problem solving scenario were maybe students aren't given quite so much direction. This might give us some indication if the overall problem solving process we are teaching is effective in multiple scenarios.