**Continuous Improvement Plan Report to be Completed in Years 2/4 of Program Review Cycle**

**Date: 1/15/2024 Name of Program: Computer Networking**

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**Table 1: CIP Student/Program Level Learning Outcomes Targeted for Improvement, Description of Assessment Measure(s) and Targets Levels of Success Table (focus on at least one student/program level outcome for the next two years)**

**Description of Fields in CIP Table 1:**

**A. Student Learning Outcome(s)** -Results expected in this program (e.g., students will be able to compare/contrast conflict and structural functional theories). Outcomes must be quantifiable and measurable.

**B. Assessment Measure(s)** –Assessmentinstrument(s)/process(es) used to measure results (e.g., embedded test questions 6 & 7 from final exam)

**C. Targeted Level(s) of Success** -Level of success expected (e.g., X% of students will score at least Y on the indicated assessment)

**Infrastructure Track PLO’s**

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| 1. **Student/Program Level Learning Outcome(s)**   **Targeted for Improvement**  (e.g., “Students will be able to…”) | **B. Description of Assessment Measure(s)**  (Assessment instrument(s)/process(es) used to measure results - Include course in which assessment will be given) | **C. Targeted Level(s) of Success**  (e.g., X% of students will score at least Y on the indicated assessment.) |
| **Infrastructure Track PLO’s** | | |
| Configure and troubleshoot advanced routing and switching protocols | Course Project Skills Based Assessment Scenario 1 Part 3 in ITCC 2377-Implementing Enterprise Network Core Technologies in which students are required to configure Routing Protocols. This part of the assessment requires the students to configure the IPv4 and IPv6 routing protocol OSPF (Open Shortest Path First).  Course Project Skills Based Assessment Scenario 1 Part 4 in ITCC2377-Impelmenting Enterprise Network Core Technologies in which students are required to configure First Hop Redundancy. Students will configure the switches to support Hot Standby Routing Protocol version 2 to provide first-hop redundancy .  Course Project Skills Based Assessment in ITCC 2379-Implementing Enterprise Advanced Routing and Services (Capstone) in which students are required to apply skills to troubleshoot network issues related to the configuration and operation of routing protocols. | 70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments  70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments  70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments |
| Calculate and Configure Internet Protocol version 4 addresses and Configure Internet Protocol version 6 addresses. | Skills Based Assessment Part 1: Develop an IP Addressing Scheme and Part 3: Configure Device IP Address in ITCC 1314-CCNA 1: Introduction to Networks in which students are required to subnet an IP address to provide addresses for the required number of hosts and configure the network devices using the calculated addresses. | 70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments |
| Configure Virtual Local Area Networks | Skills Based Assessment Part 2: Configure Network Infrastructure Settings (VLANs, Trunking, EtherChannel) in ITCC-1344-CCNA 2: Switching, Routing and Wireless Networks in which students are required to configure the switches to support host connectivity using trunking and Virtual Local Area network protocols. | 70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments |
| Configure Protocols related to Network Security | Skills Based Assessment Part 4: Configure Access Control, NAT, and perform configuration backup in ITCC 2320-CCNA 3: Enterprise networking, Security and Automation in which students are required to create access control lists for traffic filtering, configure Network Address Translation, and backup device configurations to an external server.  Course Project Skills Based Assessment Scenario 2 Part 4: Configure Security in ITCC 2377-Implementing Enterprise Network Core Technologies in which students are required to configure various security mechanisms such as usernames and passwords for Authentication, Authorization, and Accounting on the devices in the network topology. | 70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments  70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments |
| Demonstrate understanding of radio frequency principles by appropriate placement and configuration of wireless devices. | Skills-based assessment in ITNW 1351-Fundamentals of Wireless LANs in which students will demonstrate their ability to correctly configure and place access points based on their knowledge of radio frequency (RF) behaviors, signal strengths, antenna designs, and regulatory constraints. | 70% of students score 70% or higher on the specified skills-based assessment. |
| **Integrated Systems PLO’s** | | |
| Implement Operating System Services, administer, and Troubleshoot Performance Issues in MS Windows Server. | Skills-based lab assessment in ITNW1354-Implementing and Supporting Servers (Windows Server) in which students are required to demonstrate the following:   1. Configure and deploy Windows Server Domain Controllers Services. 2. Deploy Domain Controllers in Active Directory Services. 3. Students will apply skills to troubleshoot active directory and domain controller issues related to configuration. | 70% of students score 70% or higher on skills-based assessment. |
| Understand Directory Services, Group Policies and Certificate Services. | Exam-based assessment in ITNW1354-Implementing and Supporting Servers (Windows Server) will assesses the students’ ability to:   1. Describe Microsoft Azure Active Directory Services and the benefits of integrating Azure Active Directory with Active Directory Domain Services. 2. Identify Group Policy basics. 3. Explain the role of Microsoft’s Active Directory Certificate Services and certificate usage.   20 questions addressing these topics will be included on Exam #1 in the course. | 70% of students score 70% or higher on the Exam. |
| Apply Command-Line Functions Managing Operating System Services and Files. | Skills-based lab assessment in ITSC 2325-Advanced Linux (Red Hat) in which students are required to demonstrate the following:   1. Execute command-line functions 2. Demonstrate managing files from the command line 3. Execute file view, and edit text files 4. Configure file and folder permissions. | 70% of students score 70% or higher on skills-based assessments. |
| Calculate and Configure Internet Protocol version 4 addresses and Configure Internet Protocol version 6 addresses. | Skills Based AssessmentPart 1: Develop an IP Addressing Scheme and Part 3: Configure Device IP Address inITCC 1314-CCNA 1: Introduction to Networks in which students are required to subnet an IP address to provide addresses for the required number of hosts and configure the network devices using the calculated addresses. | 70% of students score 70% or higher on specified parts of Course Project/Skills-Based Assessments. |

**Add additional rows if necessary.**

**Table 2. CIP Student Learning Outcomes 1–3 (focus on at least one for the next two years)**

**Description of Fields in CIP Table 2:**

**A. Student/Program Level Learning Outcome(s) Targeted for Improvement** -Results expected in this program (e.g., Students will be able to compare/contrast conflict and structural functional theories). Outcomes must be quantifiable and measurable.

**B. Assessment Measure(s)** – **Assessment** Instrument(s)/process(es) used to measure results (e.g., embedded test questions 6 & 7 from final exam)

**C. Targeted Level(s) of Success** -Level of success expected (e.g., X% of students will earn a score of Y or greater on the embedded test questions)

**D. Description of Action Plan to Improve Learning** -Describe action(s) to be taken to improve student attainment of the indicated student/program level outcome. What will you do?

**E. Summary of Results/Data** - Summarize the information and data collected in year 1/3 when action plan was implemented.

**F. Findings** - Explain how the information and data has impacted the expected student learning outcome.

**G. Implementation of Findings** – Describe how you have used or will use your findings and analysis of the data to make improvements.

**Student/Program Level Learning Outcome Targeted for Improvement #1**

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| 1. **Student/Program Level Learning Outcome Targeted for Improvement #1:** Calculate and Configure Internet Protocol version 4 addresses and Configure Internet Protocol version 6 addresses. | |
| 1. **Assessment Measure(s):** Part 1 of Skills Assessment | 1. **Targeted Level(s) of Success:** 70% of Students will score 70% or greater on part 1 of Skills Assessment. |
| 1. **Description of Action Plan to Improve Learning:** A practice exercise has been created for students to configure ip addressing based on 50 random scenarios. This is a self grading activity which gives students immediate feedback and the instructions include the answers. | |
| 1. **Summary of Results/Data**: IP addressing is one of our most challenging learning objectives and we would like to see the score on this objective improve. | |
| 1. **Findings:** Students struggle with IP addressing. We need to provide more materials for them to become more successful. | |
| 1. **Implementation of Findings:** While our score meets our objective we will put greater effort into improving student success by providing better practice activities. | |

**Student/Program Level Learning Outcome Targeted for Improvement #2**

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| 1. **Student/Program Level Learning Outcome Targeted for Improvement #2:** Configure and troubleshoot advanced routing and switching protocols | |
| 1. **Assessment Measure(s):** Skills Assessment | **Targeted Level(s) of Success:** 70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments |
| 1. **Description of Action Plan to Improve Learning:** Give students better labs so they can practice off campus. | |
| 1. **Summary of Results/Data:** 16 of 20 Students met this objective (80%) | |
| 1. **Findings:** We realize that students need better access to labs so they can practice on their own. | |
| 1. **Implementation of Findings:** In the past we have only used Cisco’s Packet Tracer software for off-campus practice. This tool does not support all the objectives in the course. Cisco has recently made Cisco Modeling Labs (CML) available in a free version. This tool will give students the ability to practice labs and configuration off campus. | |

**Student/Program Level Learning Outcome Targeted for Improvement #3**

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| 1. **Student/Program Level Learning Outcome Targeted for Improvement #3:** Configure Virtual Local Area Networks | |
| 1. **Assessment Measure(s): Skills Based Assessment Part 2.** | 1. **Targeted Level(s) of Success:** |
| 1. **Description of Action Plan to Improve Learning:** 70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments | |
| 1. **Summary of Results/Data:** 157 of 182 Students met this objective (86%) | |
| 1. **Findings:** While we have met our goal, it is an important topic that some students have a very difficult time mastering. We have created additional simulation labs for students to master this topic. | |
| 1. **Implementation of Findings:** We have created additional practice labs that focus on VLANs to improve student performance. | |

**Program Assessment Data Report**

**Program:\_\_\_\_\_Computer Networking\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Terms Data Collected: Fall 2023, Spring 2024**

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| Program-Level Learning Outcome- (From Assessment Plan) | Assessment Measure(s) and Where Implemented in Curriculum – (From Assessment Plan) | Target Outcome(s)- Level of Success Expected – (From Assessment Plan) | Assessment Results – (Provide data in a form related to targeted levels of success to left. Indicate if targeted level of success was met, partially met, or not met.) |
| Infrastructure Track | | | |
| PLO1: Configure and troubleshoot advanced routing and switching protocols | Course Project Skills Based Assessment Scenario 1 Part 3 in ITCC 2377-Implementing Enterprise Network Core Technologies in which students are required to configure Routing Protocols. This part of the assessment requires the students to configure the IPv4 and Ipv6 routing protocol OSPF (Open Shortest Path First).  Course Project Skills Based Assessment Scenario 1 Part 4 in ITCC2377-Impelmenting Enterprise Network Core Technologies in which students are required to configure First Hop Redundancy. Students will configure the switches to support Hot Standby Routing Protocol version 2 to provide first-hop redundancy .  Course Project Skills Based Assessment in ITCC 2379-Implementing Enterprise Advanced Routing and Services (Capstone) in which students are required to apply skills to troubleshoot network issues related to the configuration and operation of routing protocols. | 70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments  70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments  70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments | 16 of 20 Students met this objective (80%)  16 of 20 Students met this objective (80%)  14 of 14 Students met this objective (100%) |
| PLO2: Calculate and Configure Internet Protocol version 4 addresses and Configure Internet Protocol version 6 addresses. | Skills Based Assessment Part 1: Develop an IP Addressing Scheme and Part 3: Configure Device IP Address in ITCC 1314-CCNA 1: Introduction to Networks in which students are required to subnet an IP address to provide addresses for the required number of hosts and configure the network devices using the calculated addresses. | 70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments | 252 of 353 Students met this objective (71%) |
| PLO3: Configure Virtual Local Area Networks | Skills Based Assessment Part 2: Configure Network Infrastructure Settings (VLANs, Trunking, EtherChannel) in ITCC-1344-CCNA 2: Switching, Routing and Wireless Networks in which students are required to configure the switches to support host connectivity using trunking and Virtual Local Area network protocols. | 70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments | 157 of 182 Students met this objective (86%) |
| PLO4: Configure Protocols related to Network Security | Skills Based Assessment Part 4: Configure Access Control, NAT, and perform configuration backup in ITCC 2320-CCNA 3: Enterprise networking, Security and Automation in which students are required to create access control lists for traffic filtering, configure Network Address Translation, and backup device configurations to an external server.  Course Project Skills Based Assessment Scenario 2 Part 4: Configure Security in ITCC 2377-Implementing Enterprise Network Core Technologies in which students are required to configure various security mechanisms such as usernames and passwords for Authentication, Authorization, and Accounting on the devices in the network topology. | 70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments  70% of students score 70% or higher on specified parts of Course Project/Skills Based Assessments | 16 of 20 Students met this objective (80%) |
| PLO5: Demonstrate understanding of radio frequency principles by appropriate placement and configuration of wireless devices. | Skills-based assessment in ITNW 1351-Fundamentals of Wireless LANs in which students will demonstrate their ability to correctly configure and place access points based on their knowledge of radio frequency (RF) behaviors, signal strengths, antenna designs, and regulatory constraints. |  | 20 of 23 Students met this objective (87%) |
| Integrated Systems Track | | | |
| PLO1: Implement Operating System Services, administer, and Troubleshoot Performance Issues in MS Windows Server. | Skills-based lab assessment in ITNW1354-Implementing and Supporting Servers (Windows Server) in which students are required to demonstrate the following:   1. Configure and deploy Windows Server Domain Controllers Services. 2. Deploy Domain Controllers in Active Directory Services. 3. Students will apply skills to troubleshoot active directory and domain controller issues related to configuration. | 70% of students score 70% or higher on skills-based assessment. | 27 of 32 Students met this objective (84%) |
| PLO2: Understand Directory Services, Group Policies and Certificate Services. | Exam-based assessment in ITNW1354-Implementing and Supporting Servers (Windows Server) will assesses the students’ ability to:   1. Describe Microsoft Azure Active Directory Services and the benefits of integrating Azure Active Directory with Active Directory Domain Services. 2. Identify Group Policy basics. 3. Explain the role of Microsoft’s Active Directory Certificate Services and certificate usage.   20 questions addressing these topics will be included on Exam #1 in the course. | 70% of students score 70% or higher on the Exam. | 26 of 32 students met this objective (81%) |
| PLO3: Apply Command-Line Functions Managing Operating System Services and Files. | Skills-based lab assessment in ITSC 2325-Advanced Linux (Red Hat) in which students are required to demonstrate the following:   1. Execute command-line functions 2. Demonstrate managing files from the command line 3. Execute file view, and edit text files 4. Configure file and folder permissions. | 70% of students score 70% or higher on skills-based assessments. | 11 of 11 Students met this objective (100%) |
| PLO4: Calculate and Configure Internet Protocol version 4 addresses and Configure Internet Protocol version 6 addresses. | Skills Based AssessmentPart 1: Develop an IP Addressing Scheme and Part 3: Configure Device IP Address inITCC 1314-CCNA 1: Introduction to Networks in which students are required to subnet an IP address to provide addresses for the required number of hosts and configure the network devices using the calculated addresses. | 70% of students score 70% or higher on specified parts of Course Project/Skills-Based Assessments. | 252 of 353 Students met this objective (71%) |
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**Add additional rows if necessary.**