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

**Date: 2/13/2025 Name of Program: Computer Science**

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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)

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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.) |
| Students will demonstrate a fundamental understanding of data types, control structures, functions/methods, and arrays in Programming I. | Common comprehensive exam in COSC 1436 (first programming course). | Minimum of 70% on comprehensive exam on the data types, control structures, functions/methods, and arrays. |
| Students will demonstrate a fundamental understanding of data types, control structures, functions/methods, and arrays in Programming II. | Common midterm exam in COSC 1437 (second programming course). | Minimum of 80% of students scoring 80% on the common midterm exam on data types, control structures, functions/methods, and arrays. |

**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:**

Students will demonstrate a fundamental understanding of data types, control structures, functions/methods, and arrays in Programming I. |
| 1. **Assessment Measure(s):**

Common midterm exam in COSC 1436 (first programming course). | 1. **Targeted Level(s) of Success:**

Minimum of 70% of students receiving 70% on the common midterm exam on data types, control structures, functions/methods, and arrays. |
| 1. **Description of Action Plan to Improve Learning:**

In order to increase exam scores on the comprehensive exam, we will add a practice exam that all students will take before they are given access to the final exam. After receiving results from this practice exam, the instructors will work with the students on the concepts that they are struggling with to help them to better prepare for the final exam. We will also analyze classes that are meeting the threshold goal to see if there is something that we could be adding to the classes that are not meeting the goal. |
| 1. **Summary of Results/Data:**

Spring 2023 to Fall 2024 data (Action Plan implementation)Spring 2023 is our baseline data. Fall 2024 data is three semesters of implementing the practice exam (action plan) The concepts listed are from specific, discrete, district-wide question banks for each particular concept. The exam given by each professor is required to pull from those specific banks dedicated to each concept.

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| **Concepts** | **Spring 2023** | **Fall 2024** | **Number of Questions tested** |
| Data Types | 66.23 | 80.88 | 5 |
| Control Structures | 68.98 | 74.01 | 13 |
| Functions | 65.31 | 72.93 | 12 |
| Arrays | 67.22 | 74.84 | 12 |

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| 1. **Findings:**

This data suggests that the action plan implementation was successful. We improved significantly in all areas of measurement. We had been below 70% in all four of our measurements, but we are now above our target in all areas. |
| 1. **Implementation of Findings:**

We will continue the use of the practice exam for all COSC 1436 students.We will focus on a new learning objective for the next action plan as we have achieved our goal for this outcome. |

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

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| 1. **Student/Program Level Learning Outcome Targeted for Improvement #2:**

Students will demonstrate a fundamental understanding of data types, control structures, functions/methods, and arrays in Programming II. |
| 1. **Assessment Measure(s):**

Comprehensive exam in COSC 1437 (second programming course). | 1. **Targeted Level(s) of Success:**

Minimum of 80% on comprehensive exam on the data types, control structures, functions/methods, and arrays. |
| 1. **Description of Action Plan to Improve Learning:**

In order to increase exam scores on the comprehensive exam, we will add a practice exam that all students will take before they are given access to the midterm exam. After receiving results from this practice exam, the instructors will work with the students on the concepts that they are struggling with to help them to better prepare for the midterm exam. We will also analyze classes that are meeting the threshold goal to see if there is something that we could be adding to the classes that are not meeting the goal. |
| 1. **Summary of Results/Data:**

The concepts listed are from specific, discrete, district-wide question banks for each particular concept. The exam given by each professor is required to pull from those specific banks dedicated to each concept.Spring 2022 vs Fall 2024 data (Action Plan implementation)

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| Concepts | Spring 2022 | Fall 2024 | Number of Questions tested |
| Data Types | 74.86 | 80.42 | 6 |
| Control Structures | 73.83 | 80.18 | 6 |
| Functions | 78.24 | 81.02 | 6 |
| Arrays | 76.89 | 80.78 | 6 |

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| 1. **Findings:**

This data suggests that the action plan implementation was successful. We improved significantly in all areas of measurement. We had been below 80% in all four of our measurements, but we are now above our target in all areas. |
| 1. **Implementation of Findings:**

We will continue the use of the practice exam for all COSC 1437 students. We will focus on a new learning objective for the next action plan as we have achieved our goal for this outcome. |

**Program Assessment Data Report**

 **Program: \_\_\_\_\_Computer Science\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Terms Data Collected: Fall 23/Spring 24/Fall 24**

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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.) |
| Students will demonstrate a fundamental understanding of data types, control structures, functions/methods, and arrays in Programming I.Students will demonstrate a fundamental understanding of data types, control structures, functions/methods, and arrays in Programming II. | Comprehensive exam in COSC 1436 covering data types, control structures, functions/methods, and arrays. Comprehensive exam in COSC 1437 covering data types, control structures, functions/methods, and arrays | Minimum of 70% on comprehensive exam for each of the following components: data types, control structures, functions/methods, and arrays in COSC 1436. Minimum of 80% on comprehensive exam for each of the following components: data types, control structures, functions/methods, and arrays in COSC 1437. |

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| **Concepts** | **Data Types** | **Control Structures** | **Functions** | **Arrays** |
| **Fall 2023** | 70.11 | 69.96 | 69.06 | 72.45 |
| **Spring 2024** | 78.64 | 72.93 | 71.38 | 74.76 |
| **Fall 2024** | 80.88 | 74.01 | 72.93 | 74.84 |

Our target of 70% for the four areas was met.

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| **Concepts** | **Data Types** | **Control Structures** | **Methods** | **Arrays** |
| **Fall 2023** | 83.10 | 76.77 | 79.86 | 78.43 |
| **Spring 2024** | 82.01 | 78.62 | 81.65 | 81.03 |
| **Fall 2024** | 80.42 | 80.18 | 81.02 | 80.78 |

Our target of 80% for all areas was met by Fall 2024. |
| Students will use object-oriented programming techniques to develop executable programs. | Final project in COSC 1437 that implements object-oriented programming techniques. A rubric will be used to measure understanding of multiple object-oriented concepts. | 70% of students will earn an overall project grade of 70% or better on the final project. Rubric measurements are gathered for each object-oriented concept. |

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| **Semester** | **Average Project Score** |
| Fall 2023 | 81.95 |
| Spring 2024 | 85.00 |
| Fall 2024 | 86.85 |

Our targeted score of 70% has been met. |
| Students will design and develop programs that implement basic data structures. | Design and develop a final project in COSC 2436 that implements common data structures.  | 70% of students will earn a grade of 70% or better on the final project. |

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| **Semester** | **Average Project Score** |
| Fall 2023 | 96.75 |
| Spring 2024 | 97.76 |
| Fall 2024 | 86.85 |

Our targeted grade of 70% has been met. However, it is clear that this project is not a good differentiator of level of knowledge. We need to alter the project or move to a comprehensive exam as our new means of measurement. |
| Students will design and develop programs that implement basic data structures. | Exam questions in COSC 2325 (first implemented in Spring 2024) targeting data representation, manipulation, and storage. | 70% of students will earn a grade of 70% or better on each of the specific targeted topics. |

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| **Semester** | **Average Exam Score** |
| Fall 2023 | Exam not yet offered - No data |
| Spring 2024 | 79.79 |
| Fall 2024 | 67.74 |

This goal has not been met. We also have a concern that the three topics are not properly differentiated within the exam. We need to address the question bank structure to ensure more discrete topic analysis. |