Discipline	Course Number	Title
Computer Science	171	CPS 171 03/24/2023- Introduction to Programming with C++
College	Division	Department
Business and Computer Technologies	Business and Computer Technologies	Computer Science & Information Technology
Faculty Preparer		Khaled Mansour
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?

   Yes

   The course was last assessed June 26th 2019.

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

   It appears that the students all met the standards of success that completed the outcome-related tasks. We did review the quizzes and programming assignments also reviewing and updating the order in which students completed the assignments to improve student success.

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

   We reviewed and updated the programming assignments, quizzes, e-book and added videos to help students absorb the course content.

II. Assessment Results per Student Learning Outcome

Outcome 1: Identify appropriate use of simple programming constructs including loops and conditional logic.

- Assessment Plan

  o Assessment Tool: Test questions

  o Assessment Date: Winter 2022

- 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: 70% of the students will score 70% or higher

- 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)
2022		

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

# of students enrolled	# of students assessed
131	87

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.

9 students withdrew from the course.

19 students did not complete the course.

4 students dropped the course.

3 students took Incomplete.

The six faculty who teach these courses are given a choice in how to test students. They can give them ten smaller quizzes, or three more comprehensive exams. Of the ten smaller quizzes, quiz 4 and quiz 5 are related to outcome 1. It is a highly laborious and difficult process to extrapolate the outcome-related questions from the comprehensive exams. For that reason, only the students that took the ten smaller quizzes were assessed.

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.

There were three Face to Face sections, two sections taught online and one was Mixed Mode. Students from each of these populations were assessed.

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

Two outcome-related quizzes were developed that included 20 questions on loops and conditional logic.

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

Outcome 1 was assessed using quiz 4 (IF) and quiz 5 (FOR). 160 out of 175 (91.43%) of student submissions (88 for quiz 4, 87 for quiz 5) scored 70% or higher on the quizzes. The standard of success was that 70% of the students would score 70% or higher. Students met the standard of success for this outcome.

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

160 out of 175 students (91.43%) were able to understand selections and Loops, especially the area of FOR loop. They demonstrated this throughout the semester using the quizzes and the machine problems they were assigned. Most of their strengths were in topics such as the FOR loop.

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.

The students met the standard of success, but they still need to improve in some topics, such as the nested loops. I can improve that by assigning more questions and videos on this topic.

Outcome 2: Identify appropriate use of simple object-oriented concepts such as constructors, functions and overriding functions.

- Assessment Plan
    - Assessment Tool: Test questions
    - Assessment Date: Winter 2022
    - Course section(s)/other population: All sections
    - 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: 70% of the students will score 70% or higher

- 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)
2022		

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

# of students enrolled	# of students assessed
131	78

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.

> 9 students withdrew from the course.
>
> 19 students did not complete the course.
>
> 4 students dropped the course.
>
> 3 students took Incomplete.
>
> The six faculty who teach these courses are given a choice in how to test students. They can give them ten smaller quizzes, or three more comprehensive exams. Of the ten smaller quizzes, one (quiz 10) is related to outcome 2. It is a highly laborious and difficult process to extrapolate the outcome-related questions from the comprehensive exams. For that reason, only the students that took the ten smaller quizzes were assessed.

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.

> There were three Face to Face sections, two sections taught online and one was Mixed Mode. Students from each of these populations were assessed.

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

An outcome-related quiz was developed that included 20 questions on functions.

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: <u>Yes</u>

Outcome 2 was assessed using 1uiz 10 (CLASS). 73 out of 78 students (93.59%) scored 70% or higher on the quizzes. The standard of success was that 70% of the students would score 70% or higher. Students met the standard of success for this outcome.

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

73 out of 78 students (93.59%) demonstrated understanding of object-oriented concepts, especially the area of the CLASS statement. They demonstrated this at the end of the semester using the quizzes and the machine problems they were assigned. Most of their strengths were in topics such as designing a CLASS.

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.

The students met the standard of success, no need to do any changes because this subject will be explained again in the next course in detail.

Outcome 3: Identify appropriate use of arrays.

- Assessment Plan

  o Assessment Tool: Test Questions

  o Assessment Date: Winter 2022

  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: 70% of the students will score better than 70%

  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)
2022		

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

# of students enrolled	# of students assessed
131	83

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.

9 students withdrew from the course.

20 students did not complete the course.

4 students dropped the course.

3 students took Incomplete.

The six faculty who teach these courses are given a choice in how to test students. They can give them ten smaller quizzes, or three more comprehensive exams. Of the ten smaller quizzes, one (quiz 7) is related to outcome 3. It is a highly laborious and difficult process to extrapolate the outcome-related questions from the comprehensive exams. For that reason, only the students that took the ten smaller quizzes were assessed.

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.

There were three Face to Face sections, two sections taught online and one was Mixed Mode. Students from each of these populations were assessed.

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

An outcome-related quiz was developed that included 20 questions on Arrays.

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

Outcome 3 was assessed using quiz 7 (ARR). 75 out of 83 students (90.36%) scored 70% or higher on the quizzes. The standard of success was that 70% of the students would score 70% or higher. Students met the standard of success for this outcome.

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

75 out of 83 students (90.36%) were able to understand Arrays especially when it comes to games. They demonstrated this throughout the semester using the quizzes and the machine problems they were assigned. Most of their strengths were in topics such as the building the Array.

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.

The students met the standard of success, no need to do any changes, but more challenges should be built in the near future.

Outcome 4: Develop C++ code that uses concepts and constructs.

- Assessment Plan

  o Assessment Tool: Programming exercises

  o Assessment Date: Winter 2022

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

  o Number students to be assessed: 25% of all students with a minimum of one full section

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

  o Standard of success to be used for this assessment: 70% of the students will create a program that executes successfully

  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)
2022		

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

# of students enrolled	# of students assessed
131	119

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.

9 students withdrew from the course.

19 students did not complete the course.

4 students dropped the course.

3 students took Incomplete.

Of the 131 students enrolled, 119 completed at least one of the programming problems. These 119 students were assessed.

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.

There were three Face to Face sections, two sections taught online and one was Mixed Mode. Students from each of these populations were assessed.

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

Students completed eight C++ projects to determine if they are able to develop software that uses concepts and constructs.

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

OUtcome 4 was assessed using a series of programming problems (m1 - m8). Not all students attempted all programming problems. 119 students completed at least one.

83.72% was the measure of success for correctly answering these programming problems; this was rounded to 85% in the data. 716 out of 952 (75.21%) students scored above 85%. The standard of success was met 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 wrote eight C++ programs during the semester and were able to demonstrate their ability to develop C++ code that uses concepts. More than 75% of the machine problems attempted were 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.

The style of the programming was different among those beginner students. Even though they met the standard of success, they need to learn the standard of writing professional programs. My plan is to rewrite the machine problems, and offering a session on the standards, so they can all use the same format.

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.

The changes were very effective. More students registered for the course. The percentage went up. Different videos and material were developed.

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 course met the students' needs. Based on their achievement, I was very happy with the results. Different projects and different exams are now designed for them for the future. I noticed many of these projects are getting old and their solution is on the internet, and that was the main reason behind the changes.

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

At the department meeting during the Winter semester.

4.
Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Outcome Language	Changed the number of students	It is very difficult to try to extrapolate	2023

	to be assessed for outcomes 1, 2, and 3. Individual quizzes will be used as the assessment tool, not comprehensive exams.	pertinent questions from the comprehensive exams, and it is faculty choice whether or not to use them. For that reason, individual quizzes will be used for assessment from now on.	
Course Assignments	All the project assignments have been changed to meet the new version of the software. All the exams have been rewritten.	The students will be able to learn different ways of solving problems, and produce better results and understanding of the material.	2023
Other: Videos	New videos were assigned to the students to include the latest version of the software and new documentation to read.	The student will learn the new version of the software and stay up to date with the technology.	2023

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

> A new internet website using AI technology is solving everything the students ask for. Something needs to be done to stop them from using that website, especially for the online students. I am still working on that.

III. Attached Files

CPS171-F22-Grades2

Faculty/Preparer:	Khaled Mansour	**Date:** 04/09/2023
Department Chair:	Scott Shaper	**Date:** 04/11/2023
Dean:	Eva Samulski	**Date:** 04/17/2023
Assessment Committee Chair:	Jessica Hale	**Date:** 07/21/2023

Discipline	Course Number	Title
Computer Science	171	CPS 171 01/10/2019-Introduction to Programming with C++
Division	Department	Faculty Preparer
Business and Computer Technologies	Computer Science & Information Technology	Khaled Mansour
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 appropriate use of simple programming constructs including loops.

- Assessment Plan

    o   Assessment Tool: Test Questions

    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: 70% of the students who take the exam will score better than 70%

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)
	2019	

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

# of students enrolled	# of students assessed
100	72

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 sections (excluding the students who audited the 2 sections) were assessed. Seven students withdrew or dropped the course

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 sections (excluding the students who audited the sections) were assessed. The sections were Face-2-Face day sections, and one section was taught online.

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

Quizzes / tests that included questions on loops.

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

68 out of 72 students (94%) scored 72% (36 of 50 points) or higher on the quizzes. The standard of success was that 70% of the students would score 70% or higher. Students met the standard of success for this outcome.

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

> 68 out of 72 students (94%) were able to understand Loops, especially the area of FOR loop. They demonstrated this throughout the semester using the quizzes and the machine problems they were assigned. Most of their strengths were in topics such as the FOR loop.

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.

> The students met the standard of success, but they still need to improve in some topics, such as the WHILE loop. I can improve that by assigning more in-class labs on this topic.

Outcome 2: Identify appropriate use of simple programming constructs including conditional logic.

- Assessment Plan

  o Assessment Tool: Test Questions

  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: 70% of the students who take the exam will score better than 70%

  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)
	2019	

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

# of students enrolled	# of students assessed
100	72

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 sections (excluding the students who audited the sections) were assessed. Seven students withdrew or dropped the course

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 sections (excluding the students who audited the sections) were assessed. The sections were Face-2-Face day sections, and one section was taught online.

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

> Quizzes / tests that included questions on conditional logic.

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: <u>Yes</u>
>
> 65 out of 72 students (90%) scored 74% (37 of 50 points) or higher on the quizzes. The standard of success was that 80% of the students would score 70% or higher. Students met the standard of success for this outcome.

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

> 65 out of 72 students (90%) were able to understand conditional logic, especially the area of the IF statement. They demonstrated this throughout the semester using the quizzes and the machine problems they were assigned. Most of their strengths were in topics such as the IF statement.

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.

> The students met the standard of success, but still they need to improve in some topics of conditional logic such as SWITCH. I can improve this by assigning more in-class labs on this topic.

Outcome 3: Identify appropriate use of simple object-oriented concepts such as constructors, functions and overriding functions.

- Assessment Plan

  - o Assessment Tool: Test Questions

  - 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: 70% of the students who take the exam will score better than 70%

  - 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)
	2019	

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

# of students enrolled	# of students assessed
100	72

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 sections (excluding the students who audited the sections) were assessed. Seven students withdrew or dropped the course

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 sections (excluding the students who audited the sections) were assessed. The sections were Face-2-Face day sections, and one section was taught online.

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

Quizzes / Tests that included questions on Object Oriented concepts and Constructors.

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: <u>Yes</u>

62 out of 72 students (86%) scored 70% (35 of 50 points) or higher on the quizzes. The standard of success was that 70% of the students would score 70% or higher. Students met the standard of success for this outcome.

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

62 out of 72 students (86%) were able to understand object oriented concepts, especially the area of the CLASS statement. They demonstrated this at the end of the semester using the quizzes and the machine problems they were assigned. Most of their strength were in topics such as designing a CLASS.

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.

The students met the standard of success, but still they need to improve in some topics of CLASSES, such as connecting class to objects. I can improve this by assigning a simpler machine problem and easier questions on the quiz.

Outcome 4: Identify appropriate use of Arrays.

- Assessment Plan

    o Assessment Tool: Test Questions

    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: 70% of the students who take the exam will score better than 70%

    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)
	2019	

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

# of students enrolled	# of students assessed
100	72

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 sections (excluding the students who audited the sections) were assessed. Four students withdrew or dropped the course

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 sections (excluding the students who audited the sections) were assessed. The sections were Face-2-Face day section, and one section was taught online.

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

Quizzes / Tests that included questions on Arrays.

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

62 out of 72 students (87.5%) scored 90% (45 points) or higher on the quizzes. The standard of success was that 70% of the students would score 70% or higher. Students met the standard of success for this outcome.

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

65 out of 72 students (92%) were able to identify the user of ARRAYS, especially the area of creating them. They demonstrated this throughout the semester using the quizzes and the machine problems they were assigned. Most of their strengths were in topics such as creating arrays and using them.

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.

The students met the standard of success and have nothing to improve, but the material is changing very rapidly, especially with new technology. Therefore, my plan is to stay up-to-date with the C++ standard Library and teach them the latest and the greatest.

Outcome 5: Develop C++ code that uses concepts and constructs.

- Assessment Plan

    o   Assessment Tool: Programming exercises

    o   Assessment Date: Winter 2017

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

    o   Number students to be assessed: 25% of all students with a minimum of one full section.

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

    o   Standard of success to be used for this assessment: 70% of the students will create a program that successfully executes.

    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)
	2019	

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

# of students enrolled	# of students assessed
100	72

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 sections (excluding the students who audited the sections) were assessed. Seven students withdrew or dropped the course

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 sections (excluding the students who audited the sections) were assessed. The sections were Face-2-Face day sections, and one section was taught online.

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

> Students completed eight machine problems to determine if they are able to develop software that uses concepts and constructs.

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: <u>Yes</u>
>
> Not all students attempted all programming problems. Only 347 (out of 448 possible) problems were attempted. Out of those 347 attempts, 311 (89.6%) were successful in developing those programming problems. Even if we take into account the 448 possible problems, almost 70% of the problems were solved correctly. Therefore, the students met the standard of success outlined 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 wrote eight C++ programs during the semester and were able to demonstrate their ability to develop C++ code that uses concepts. 92% of the machine problems attempted met the standard of success.

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.

> The style of the programming was different among those beginner students. Even though they met the standard of success, they need to learn the standard of writing professional programs. My plan is to help the students by focusing on that subject earlier in the semester and offering a session on the standards, so they can all use the same format.

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 assessment report was done.

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 course met the students' needs. Based on their achievement, I was really surprised to see the students split into two groups: one finished the course, one quit the course completely, and there was no middle ground. Also, I found the area that made the second group of students quit, and I will improve the material to make sure they understand it and stay in the class.

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

At the department meeting in the Fall semester.

4.

Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Course Assignments	A couple assignments were worded in such a way that the students had a hard time understanding the objectives and requirements of those assignments. I need to either replace those assignments with new ones or change the wording of those assignments.	The students will be able to solve the problems and produce the correct results.	2019
Course Assignments	We will add additional in-class labs that emphasize	The assessment demonstrated that students need more	2019

	various topics that tend to be more challenging for students (e.g. WHILE loop, SWITCH).	time to engage with these topics in class.	
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	New videos and more examples need to be added to the Blackboard course.	The videos will give the students more understanding of the subjects, and they can go back and review it any time they wish.	2019
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	The standard of writing professional programs will be addressed earlier in the semester.	The assessment demonstrated that beginner students need to learn the standard professional programming style. By emphasizing this earlier in the semester, beginner students will have more time to practice the format, so that by the end of the semester, all students are programming using the professional standard.	2019

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

   6.

III. Attached Files

c++ sheet of assessment

Faculty/Preparer: Khaled Mansour **Date:** 06/26/2019
Department Chair: Philip Geyer **Date:** 06/29/2019
Dean: Eva Samulski **Date:** 07/01/2019
Assessment Committee Chair: Shawn Deron **Date:** 08/19/2019