

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Computer Science	120	CPS 120 12/22/2020- Introduction to Computer Science
Division	Department	Faculty Preparer
Business and Computer Technologies	Computer Science & Information Technology	David Rodgers
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 basic computer concepts.

- Assessment Plan
 - Assessment Tool: Departmental exam
 - Assessment Date: Winter 2019
 - Course section(s)/other population: All sections
 - Number students to be assessed: All students
 - How the assessment will be scored: Answer key
 - Standard of success to be used for this assessment: 70% of the students will score 70% or higher

- Who will score and analyze the data: Course instructors
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)
2020		
 2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
76	60
 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.

I included everyone from all three sections who took the exam.
 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 three sections were virtual classroom courses.
 5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The tool used to evaluate was derived from the total scores on the departmental examination (a thorough test of basic computer skills). All questions on the exam were related to outcome #1. The test included true/false, fill-in-the-blank and programming. There was an answer key and partial credit was given.
 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
 93% of the students (56 out of 60) scored 70% or higher. The standard of success was met.
 7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The students achieved a high level of success, particularly as they were unenlightened in concepts such as computer componentry, logic, and how software becomes hardware in devices.

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.

Nothing needs to be improved.

Outcome 2: Demonstrate numbering conversion between different systems.

- Assessment Plan
 - Assessment Tool: Departmental exam
 - Assessment Date: Winter 2019
 - Course section(s)/other population: All sections
 - Number students to be assessed: All students
 - How the assessment will be scored: Answer key
 - Standard of success to be used for this assessment: 70% of the students will score 70% or higher
 - Who will score and analyze the data: Course instructors

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)
2020		

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

# of students enrolled	# of students assessed
76	60

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.

I included everyone from all three sections who took the exam.

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 three sections were virtual classroom courses.

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

The students were asked to convert from one number system to another. Their work was scored using an answer key.

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

58/60 students scored 70% or better for a success rate of 97% on the test. This meets the standard of success.

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

Students struggle with number conversions at first. The concept is unknown to all but a few. High success is achieved by emphasis on drill, and repetition, and by going over student questions with classroom participation.

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.

Nothing needs to be improved.

Outcome 3: Develop a logic algorithm for certain problems.

- Assessment Plan
 - Assessment Tool: Departmental exam
 - Assessment Date: Winter 2019
 - Course section(s)/other population: All sections
 - Number students to be assessed: All students

- How the assessment will be scored: Answer key
 - Standard of success to be used for this assessment: 70% of the students will score 70% or higher
 - Who will score and analyze the data: Course instructors
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) |
| 2020 | | |
2. Provide assessment sample size data in the table below.
- | # of students enrolled | # of students assessed |
|------------------------|------------------------|
| 76 | 60 |
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.
- I included everyone from all three sections who took the exam.
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 three sections were virtual classroom courses.
5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.
- The students were asked to create an algorithm to process information and calculate a result, with a sentinel value signaling the end of input. 10 points were possible, and the major criterions were failure to use the sentinel, or an incomplete understanding of the components of a successful algorithm (That it is doable, and comes to a completion, etc.).
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
 57/60 students (95%) scored 70% or higher. The standard of success was met.

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

Students thrive once they understand the importance of pre-planning before coding, and the need to separate syntax issues from logic. Once they see that the algorithm is the logic solution to the task and the code is then written to prove the logic, their speed in coding and results improve quickly. This results in growing excitement for coding.

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.

Nothing needs to be improved.

Outcome 4: Identify basic networking concepts.

- Assessment Plan
 - Assessment Tool: Departmental exam
 - Assessment Date: Winter 2019
 - Course section(s)/other population: All sections
 - Number students to be assessed: All students
 - How the assessment will be scored: Answer key
 - Standard of success to be used for this assessment: 70% of the students will score 70% or higher
 - Who will score and analyze the data: Course instructors
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)
2020		

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

# of students enrolled	# of students assessed
76	57

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.

I included everyone from all three sections who took the exam.

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 sections were taught in the virtual format.

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

Four questions were asked on the final exam covering HTML web code, how to display HTML and about client vs. server networking. The questions were scored using an answer key.

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

46 of 57 students (81%) scored 70% or higher. Students met the standard of success.

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

Students quickly understand this topic, as it is well exemplified by their daily use of computers. Analogies are easy to find and teaching can focus on areas where the class shows confusion.

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.

Nothing needs to be improved.

Outcome 5: Demonstrate sound software engineering techniques in developing a working software program.

- Assessment Plan
 - Assessment Tool: Portfolio of software programs
 - Assessment Date: Winter 2019
 - Course section(s)/other population: All sections
 - Number students to be assessed: Random sample of 50% of all students with a minimum of one full section
 - How the assessment will be scored: Rubric
 - Standard of success to be used for this assessment: Students will earn a total rubric score of 5 or higher out of 8. Students will earn a minimum of 2 out of 4 on the "Program Execution Rubric" and a 2 out of 4 on the "Program Readability Rubric."
 - 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)
2020		

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

# of students enrolled	# of students assessed
76	54

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.

I included everyone from all three sections who took the exam.

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 three sections were virtual classroom courses.

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

Three examples of programming were used. The final Python project and the last two C++ projects (as they were the final efforts for the course). The projects were scored using a rubric that was on a scale of 0 - 10.

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

78% percent of students (42/54 students) scored 70% or higher. This meets the standard of success.

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

Object Oriented Programming and professional coding techniques are stressed throughout the course. By having grading reflect the importance of coding technique over correct answers, this area becomes a learning strength for students.

It is particularly hard to teach these concepts to students who come to class with previous coding experience that values answers over process. They come to enlightenment as they continuously see themselves graded off for technique issues.

This practice should continue as the problems posed in this course are rudimentary. There is room to teach coding competencies.

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.

Nothing needs to be improved.

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.

There was no previous assessment report.

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 course meets the needs of students quite well. It was designed as a bridge for students who would struggle with the traditional introduction to programming courses (CPS 141, 161, 171), yet at first it had a very high drop rate. I determined that the major cause was starting the class with math intensive subjects such as

number conversions, truth table calculations, and taking the negative two's complement of binary numbers, and more.

This drop rate was greatly improved by moving the first Python module to Learning Unit One. This gives the students a gentler start to the course with some quickly attainable goals. It also builds more excitement for the more demanding Computer Science learning unit.

Unit Two Computer Science, has been simplified by treating some non-essential material as optional, and removing the negative two's complement topic. The key learning of the unit remains.

I also was able to reduce the drop rate by refocusing the course on demystification of the concepts, and introducing reduced stress learning. Demystification is done by treating the class like a real-world programming team with me as the team leader. We approach the concepts as a team and work together as often as possible to help understanding. We discuss and sometimes vote about due dates, extra material to cover for extra credit, and how to improve course-flow. I end each course with a talk on getting a job followed by an extra credit mock job interview. Here I discover how fully a student understands the course concepts, and they are rewarded on merit. As students come to WCC for career advancement, conducting the course as a simulation of a computer science workplace is invigorating to them.

Reduced stress learning is achieved by giving multiple attempts at assignments if there is a learning benefit for the student. The goal is for everyone to get 100 percent scores on the assignments and for everyone to build confidence and excitement for the material.

Some of the quizzes are given in a two-attempt format, where the first attempt is closed book, and the second one is open book. If the student can correct their work and explain why there was an error, I give full points.

I can honestly say that all students who invest into the course achieve the desired goal, and will therefore be in good shape for CPS 141,161,171.

I was pleasantly surprised that the statistical results exceeded my expectations.

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

During the departmental meeting.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Assessment Tool	A test should be given toward the end of each course that can be graded automatically. This test should be built specifically to gauge the success of this course's teaching goals.	This will make creating the data gathering for the next three-year assessment very simple, as the results of this test will be directly related to the learning goals of the course. Statistical analysis will then include every student across multiple years, and can be easily analyzed and graphed.	2022
Course Assignments	The programming assignments should be improved, leading toward a rotating library of assignment possibilities for Python and C++ coding tasks.	The creation of a rotating library of programming assignments will reduce cheating and increase student involvement, as they can pick areas of interest.	2022
Course Assignments	More group participation Lab assignments should be created in the form of group contests (vote for best team for bonus points, pick your team MVP, etc.).	The current generation of students respond well to this type of learning.	2022
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	Emphasize the networking material and add material on cybersecurity. Reduce the web site building components.	Student interest in careers in cybersecurity and networking.	2022

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

6.

III. Attached Files

[CPS 120 Supporting Data](#)

Faculty/Preparer: David Rodgers **Date:** 03/01/2021
Department Chair: Cyndi Millns **Date:** 03/02/2021
Dean: Eva Samulski **Date:** 03/12/2021
Assessment Committee Chair: Shawn Deron **Date:** 03/31/2021