

**Course Assessment Report  
Washtenaw Community College**

Discipline	Course Number	Title
Computer Science	272	CPS 272 01/09/2019-Data Structures with C++
Division	Department	Faculty Preparer
Business and Computer Technologies	Computer Instruction	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 object-oriented design methods.

- Assessment Plan
  - Assessment Tool: Multiple choice and short answer questions on a departmental exam.
  - Assessment Date: Fall 2009
  - Course section(s)/other population: all
  - Number students to be assessed: all
  - How the assessment will be scored:
  - Standard of success to be used for this assessment:

- Who will score and analyze the data:

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)
2018	2018	

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

# of students enrolled	# of students assessed
29	29

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.

N/A

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.

The students were included from Winter 2018 (DL section), Winter 2018 (Face-to-Face), Fall 2018 (DL section) and Fall 2018 (Face-to-Face) sections.

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

The process used to assess this outcome was questions from weekly quizzes.  
Each question is either a short answer or a multiple choice question. The questions are scored using either 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  
The result of this assessment was that 94% of the students achieved 80% or above.  
The result came based on two quizzes. All the students scored 90% on the first quiz, but only 92% of them scored 80% or above on the second quiz. Even though the standard of success is met, 8% did not do well on the second quiz and that was due on language of some of those questions and their ambiguity.

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

Students performed well on this outcome. They understood vectors, linkedlists and arrays. They were able to use these to implement programs.

- 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.

There is no need for improvement of this outcome achievement. Even though the students met the standard of success, I wish to change the language of some questions to make sure 100% of the students achieve 100% of success.

Outcome 2: Identify appropriate use of recursive programming techniques.

- Assessment Plan
  - Assessment Tool: Multiple choice and short answer questions on a departmental exam.
  - Assessment Date: Fall 2009
  - Course section(s)/other population: all
  - Number students to be assessed: all
  - How the assessment will be scored:
  - Standard of success to be used for this assessment:
  - Who will score and analyze the data:

- 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)
2018	2018	

- Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
29	29

- 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.

N/A

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.

The students were included from Winter 2018 (DL section), Winter 2018 (Face-to-Face), Fall 2018 (DL section) and Fall 2018 (Face-to-Face) sections.

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

The process used to assess this outcome was questions from weekly quizzes.

Each question is either a short answer or a multiple choice question. The answers 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

Out of the entire student population, 93% of them scored 80% or above. Students did well on most of the questions related to recursion.

The standard of success was met, but some of those questions were very hard to solve and need to be reviewed.

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

The students were strong in every area of this outcome which covers recursive programming techniques.

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.

Some questions will be reviewed. Recursion is a complex process where students solve a problem that is a maze.

Outcome 3: Identify appropriate use of programming data structures: vectors, linked lists, stacks, queues and binary trees.

- Assessment Plan

- Assessment Tool: Multiple choice and short answer questions on a departmental exam.
- Assessment Date: Fall 2009
- Course section(s)/other population: all
- Number students to be assessed: all
- How the assessment will be scored:
- Standard of success to be used for this assessment:
- Who will score and analyze the data:

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)
2018	2018	

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

# of students enrolled	# of students assessed
29	29

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.

N/A

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.

The students were included from Winter 2018 (DL section), Winter 2018 (Face-to-Face), Fall 2018 (DL section) and Fall 2018 (Face-to-Face) sections.

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

The process used to assess this outcome was questions from weekly quizzes.  
Each question is either a short answer or a multiple choice question. Responses 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: <u>Yes</u>
Out of all the students, 96.5% scored 80% on all the quizzes related to this outcome. This outcome has questions from 6 quizzes. They scored the same percentage on all the quizzes.

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

The students were strong in every area of this outcome. Students use stacks, queues and binary trees to solve these programming problems. The students performed equally well on all areas. This is probably due to the similarity of the data structure.
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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.

No need for improvement.
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Outcome 4: Demonstrate sound software engineering techniques in developing a working software program.

- Assessment Plan
  - Assessment Tool: A portfolio of software programs submitted by students will be blind graded.
  - Assessment Date: Fall 2009
  - Course section(s)/other population: all
  - Number students to be assessed: all
  - How the assessment will be scored:
  - Standard of success to be used for this assessment:
  - Who will score and analyze the data:

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)
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2018	2018	
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2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
29	29

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.

N/A

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.

The students were included from Winter 2018 (DL section), Winter 2018 (Face-to-Face), Fall 2018 (DL section) and Fall 2018 (Face-to-Face) sections.

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

The process used to assess this outcome was for students to write 7 machine programs. Each program covers one or two course objectives. The program output is scored using a rubric.

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  
 97% of the students were able to demonstrate the ability to develop working software and score 100%. 3% of them failed completely to write one program and scored 50% or less. The reason behind this is those students fell behind on the first project and couldn't understand the material well enough to solve the rest or skipped half of them and solved the one they could.

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

The students were strong in every area of this outcome. Students applied software engineering techniques to develop a working program. Students have to implement the hashing technique in this program.

- 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.

Students who persist in the course, perform well. However, a few students stopped participating in the course. To improve this, I need to make sure they either withdraw from the course at early stage, so they don't fail, or offer them more help such as one-on-one tutoring or group study.

### III. Course Summary and Intended Changes Based on Assessment Results

- 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.

N/A

- 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 overall impression is that the students did very well on achieving every goal and went beyond their expectation. I was expecting the number of success to be in the 80% but I was surprised to see it in the 90%. That means everything is going as planned and more.

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

This information will be shared with the faculty in my department during the department's meetings when needed.

- Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Assessment Tool	Test questions will be reviewed. This aligns with our move to using an OER for this course.	Needed due to new OER.	2018

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

Nothing.

### III. Attached Files

#### [CPS 272 Scores](#)

<b>Faculty/Preparer:</b>	Khaled Mansour	<b>Date:</b> 01/10/2019
<b>Department Chair:</b>	Philip Geyer	<b>Date:</b> 02/18/2019
<b>Dean:</b>	Eva Samulski	<b>Date:</b> 02/19/2019
<b>Assessment Committee Chair:</b>	Shawn Deron	<b>Date:</b> 04/18/2019

**COURSE ASSESSMENT REPORT**

**I. Background Information**

1. Course assessed:  
 Course Discipline Code and Number: CPS272  
 Course Title: Data Structures C++  
 Division/Department Codes: Computer Science

2. Semester assessment was conducted (check one):

- Winter 2009  
 Winter 20\_\_  
 Spring/Summer 20\_\_

3. Assessment tool(s) used: check all that apply.

- Portfolio  
 Standardized test  
 Other external certification/licensure exam (specify):  
 Survey  
 Prompt  
 Departmental exam  
 Capstone experience (specify):  
 Other (specify):

4. Have these tools been used before?

- Yes  
 No

If yes, have the tools been altered since its last administration? If so, briefly describe changes made.  
 N/A

5. Indicate the number of students assessed/total number of students enrolled in the course.

18/18

6. Describe how students were selected for the assessment.

The whole class was selected.

**II. Results**

1. Briefly describe the changes that were implemented in the course as a result of the previous assessment.  
 No previous assessment

2. State each outcome (verbatim) from the master syllabus for the course that was assessed.

1. Identify appropriate use of Object-oriented design methods.
2. Identify appropriate use of Recursive programming techniques.
3. Identify appropriate use of data structures: vectors, linked lists, stacks, queues and binary trees.
4. Demonstrate sound software engineering techniques in developing a working software program.

3. Briefly describe assessment results based on data collected during the course assessment, demonstrating the extent to which students are achieving each of the learning outcomes listed above:

All of the assessment goals were achieved as stated in the CPS 272 master syllabus.

4. For each outcome assessed, indicate the standard of success used, and the percentage of students who achieved that level of success.

- 1) 83% Success: Identify appropriate use of Object-oriented design methods.
- 2) 80% Success: Identify appropriate use of Recursive programming techniques
- 3) 84% Success: Identify appropriate use of data structures: vectors, linked lists, stacks, queues and binary trees.

**COURSE ASSESSMENT REPORT**

- 4) 89% Success: Demonstrate sound software engineering techniques in developing a working software program.

*The detailed data collected is included as a separate file to this report*

- 5. Describe the areas of strength and weakness in students' achievement of the learning outcomes shown in assessment results.  
Strengths: Students were able to master the concepts listed in the syllabus. The class had many competent C++ students.

**III. Changes influenced by assessment results**

- 1. If weaknesses were found (see above) or students did not meet expectations, describe the action that will be taken to address these weaknesses.
  
- 2. Identify intended changes that will be instituted based on results of this assessment activity (check all that apply). Please describe changes and give rationale for change. **No Changes**
  - a.  Outcomes/Assessments on the Master Syllabus  
Change/rationale:
  
  - b.  Objectives/Evaluation on the Master Syllabus  
Change/rationale:
  
  - c.  Course pre-requisites on the Master Syllabus  
Change/rationale:
  
  - d.  1<sup>st</sup> Day Handouts  
Change/rationale:
  
  - e.  Course assignments  
Change/rationale:
  
  - f.  Course materials (check all that apply)
    - Textbook
    - Handouts
    - Other:
  
  - g.  Instructional methods  
Change/rationale:
  
  - h.  Individual lessons & activities  
Change/rationale:

- 3. What is the timeline for implementing these actions? N/A

**IV. Future plans**

- 1. Describe the extent to which the assessment tools used were effective in measuring student achievement of learning outcomes for this course.

The final exam given covers each of the course objectives as stated in the CPS 271 syllabus. The results indicated above are consistent with the expectations of the department

- 2. If the assessment tools were not effective, describe the changes that will be made for future assessments.  
N/A

**COURSE ASSESSMENT REPORT**

3. Which outcomes from the master syllabus have been addressed in this report?

All X Selected \_\_\_\_\_

If "All", provide the report date for the next full review: \_\_\_\_\_ Fall 2010 \_\_\_\_\_.

If "Selected", provide the report date for remaining outcomes: \_\_\_\_\_.

**Submitted by:**

Name: Clarence Hasselbach Clarence Hasselbach Date: 8/10/09  
Print/Signature

Department Chair: Clarence Hasselbach Clarence Hasselbach Date: 8/10/09  
Print/Signature

Dean: Rosemary Wilson Rosemary Wilson Date: 8/11/09  
Print/Signature

*logged 8/14/09 sjv*