Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Chemistry	140	CEM 140 05/17/2019-Organic Biochemistry
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Physical Sciences	Breege Concannon
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

   Winter 2007

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

   Students had an average score of 79% on the previous assessment, with 76.22% for outcome 1, 79.84% for outcome 2 and 84.09% for outcome 3. However, this was my first assessment report at WCC, so when I collected the data and wrote the report, I used the average student scores and not the stated 70% of students will score higher than 70%. This time I am using both measures to compare the students.

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

   The outcomes were changed on the master syllabus to more closely reflect the course content and the new syllabus forms at the time. Also, the course textbook was changed to a more updated version. As no weaknesses were found, no other action was taken at that time.

II. Assessment Results per Student Learning Outcome

Outcome 1: Identify and name the major organic functional groups and their reaction products.

- Assessment Plan

- Assessment Tool: ACS test
- Assessment Date: Winter 2010
- Course section(s)/other population: all
- Number students to be assessed: all
- How the assessment will be scored: Test will be scored according to ACS standards, it is all multiple-choice.
- Standard of success to be used for this assessment: 70% of the students must score 70% or higher on the test.
- Who will score and analyze the data: Full-time 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)
2018, 2017	2017	

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

# of students enrolled	# of students assessed
119	71

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.

Multiple sections from different semesters were assessed. The semesters include Fall '18 day and evening sections, Winter and Fall '17. However, the day CEM 140 Fall '17 sections were not assessed, and some students may have stopped coming to class by the last day of lab, when the test is administered.

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 day and evening sections from multiple semesters. In Fall '18, all sections, day and evening, were assessed. In Winter '17, the day sections were assessed. In Fall '17, only the evening section was assessed.

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

The American Chemical Society test was used, which is all multiple choice and scored using scantrons. Comparison to national norms are possible with this test. There are 80 questions total, with 40 for outcome 1.

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: No
Students scored an average of 68% for outcome 1, with 50.7% of students scoring 70% or higher. This does not meet the outcome's standard of success: 70% must score 70% or higher. However, this is a national exam where averages are in the 50th percentile range, so our students are performing higher than the national norms. In the future, I will use a different assessment test because this one has been used for many years, and I am running out of clean copies of the exam for the students.

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

Students generally did well on naming organic compounds and recognizing different functional groups, as evidenced from the item analysis, which shows that only two students couldn't identify acetone. However, they had issues with isomers, as evidenced from the fact that 48 students got this question wrong. The average score was 68%, which is higher than the national norms, and as the organic part of this course is covered in the first seven weeks of the course, I am actually quite happy with the results obtained. The average score is somewhat lower than the last time the course was assessed, and I have no explanation for this.

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.

As isomers and molecular formulas are an area of poor performance, I plan on doing more examples in class to emphasize these topics.

Outcome 2: Characterize the main classes of biomolecules; carbohydrates, lipids, proteins, and nucleic acids, and their biological functions.

- Assessment Plan
    - Assessment Tool: ACS test

- Assessment Date: Winter 2010
- Course section(s)/other population: all
- Number students to be assessed: all
- How the assessment will be scored: Test will be scored according to ACS standards, it is all multiple-choice.
- Standard of success to be used for this assessment: 70% of the students must score 70% or higher on the test.
- Who will score and analyze the data: Full-time 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)
2018, 2017	2017	

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

# of students enrolled	# of students assessed
119	71

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.

Multiple sections from different semesters were assessed. The semesters include Fall '18 day and evening sections, Winter and Fall '17. However, the day CEM 140 Fall '17 sections were not assessed, and some students may have stopped coming to class by the last day of lab, when the test is administered.

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 day and evening sections from multiple semesters. In Fall '18, all sections, day and evening, were assessed. In Winter '17, the day sections were assessed. In Fall '17, only the evening section was assessed.

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

The American Chemical Society test was used, which is all multiple choice and scored using scantrons. Comparison to national norms are possible with this test. There are 40 multiple choice questions that cover outcomes 2 and 3, with 34

for outcome 2 and 6 (unfortunately) for outcome 3. I did not separate outcomes 2 and 3 from each other.

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: No
49.3% of students scored 70% or higher on outcome 2 and 3. The average score on this section of the test was 66.58%. Again, this does not meet the outcomes, but once again, the national norms on this test are in the 50th percentile range. Therefore, our students are scoring higher than national norms. As I said before, I am planning to use a new assessment test from now on, as the number of clean copies of the test I have are getting smaller and smaller every time I use the test. Again, the average score is lower than the last assessment report, and I cannot explain this.

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

Again, our students are scoring higher than national norms, with high scores especially in the area of enzymes. Also on questions that had parallels to other courses students were taking, or had taken, they did really well. For example, only seven students didn't identify insulin as being able to reduce blood glucose levels. Some questions that were poorly answered mainly involved reactions of biological compounds, so I may put more emphasis on reactions in future semesters.

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.

I will emphasize biological reactions in future semesters, but I also plan to change the assessment test to an in-house developed one. So in the future, the assessment will more closely match what we do in the course; some of the biochemistry questions on the ACS test are not actually covered in this course.

Outcome 3: Briefly outline metabolic pathways and their regulation in the body, e.g. citric acid cycle, electron transport chain, glycolysis etc.

- Assessment Plan
    - Assessment Tool: ACS test
    - Assessment Date: Winter 2010

- Course section(s)/other population: all
- Number students to be assessed: all
- How the assessment will be scored: Test will be scored according to ACS standards, it is all multiple-choice.
- Standard of success to be used for this assessment: 70% of the students must score 70% or higher on the test.
- Who will score and analyze the data: Full-time 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)
2018, 2017	2017	

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

# of students enrolled	# of students assessed
119	71

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.

Multiple sections, from different semesters, were assessed. The semesters include Fall '18 day and evening sections, Winter and Fall '17. However, the day CEM 140 Fall '17 sections were not assessed, and some students may have stopped coming to class by the last day of lab, when the test is administered.

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 day and evening sections from multiple semesters. In Fall '18, all sections, day and evening, were assessed. In Winter '17, the day sections were assessed. In Fall '17, only the evening section was assessed.

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

The American Chemical Society test was used, which is all multiple choice and scored using scantrons. Comparison to national norms are possible with this test. There are 40 multiple choice questions that cover outcomes 2 and 3, with 34 for outcome 2 and 6 (unfortunately) for outcome 3. I did not separate outcomes 2 and 3 from each other.

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: No
49.3% of students scored 70% or higher on outcome 2 and 3. The average score on this section of the test was 66.58%. Again, this does not meet the outcomes, but once again, the national norms on this test are in the 50th percentile range. Therefore, our students are scoring higher than national norms. As I said before, I am planning to use a new assessment test from now on, as the number of clean copies of the test I have are getting smaller and smaller every time I use the test. Again, the average score is lower than the last assessment report, and I cannot explain this.

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

Again, our students are scoring higher than national norms, with high scores especially in the area of enzymes. Also on questions that had parallels to other courses students were taking or had taken they did really well, for example only seven students didn't identify insulin as being able to reduce blood glucose levels. Some questions that were poorly answered mainly involved reactions of biological compounds, so I may put more emphasis on reactions in future semesters.

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.

I will emphasize biological reactions in future semesters, but I also plan to change the assessment test to an in-house developed one. So in future, the assessment will more closely match what we do in the course; some of the biochemistry questions on the ACS test are not actually covered in this course.

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 were no changes previously, apart from updating the course outcomes to align with the new syllabus forms at the time. Also, the change in the textbook was to respond to student concerns and college concerns about the cost of books. In the intervening years, OERs have become more available.

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?

I am happy with how our students are performing. Relative to national norms, our students are consistently doing well on this test. I am not surprised the students are not performing at a really high level, as the test is cumulative. Since the course is 15 weeks long, it covers an enormous amount of material, and, honestly, the students will never use the material again in their professional lives. They understand they need to do well in the course and get a good grade so they can move on, but this is the last chemistry course they will ever take. The last part of the course, which we have barely three weeks to cover, is probably the only part that will be relevant to their future careers. Also, this test was written in 1995, so it is 24 years old. At times, the format of the questions is confusing for the students, as are some of the drawings of the structures. I was holding on to this test as it is a nationally recognized exam, and I was somehow afraid if I wrote my own test I would make it too easy, or I wouldn't be getting data I can compare to other colleges. However, I now realize that I have to write my own exam, so that the format is easier for the students to understand and also so that the structures I use are the same as the ones they have seen all semester in class. The ACS test is in a booklet comprising multiple tests, so when our students take it they only take a small subset of the tests, which is confusing. As I previously stated, I only have a limited number of clean copies left now, and the test is actually fully available online if students look for it.

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

At a department meeting in the fall.

4.

Intended Change(s)

Intended Change	Description of the change		Rationale	Implementation Date
Assessment Tool	Assessment Tool	I plan to write my own assessment test and administer it every semester	The ACS test does not separate out the outcomes very well: there are 40 questions for outcome 1, 34 for outcome 2, and only 6 for outcome	2019

		to get data every semester the course is taught. The ACS test is nice, but at this point I have been using the same test for the past 16 years, and it was used prior to this time also. As some of the questions are not even relevant to my course, and also the format of the test is confusing having my own test will be a better option, and I won't have to worry about students writing on the test and destroying	3. So this is an issue. Also the format of the test is confusing because the students only take parts of the tests that are in the booklet we use. Many copies of the test have become defaced over the years, and I know the test is available online to the students, as it is old. Some of the formatting of questions in the test is also outdated and not the same as the format I use in class, so my own test will more closely match the format the students are used to.	

		it. I can just print more copies off!		

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

6.

III. Attached Files

Raw scores

Faculty/Preparer:	Breege Concannon	**Date:**	05/20/2019
Department Chair:	Suzanne Albach	**Date:**	05/21/2019
Dean:	Kimberly Jones	**Date:**	06/05/2019
Assessment Committee Chair:	Shawn Deron	**Date:**	07/08/2019

WASHTENAW COMMUNITY COLLEGE

COURSE ASSESSMENT REPORT

I. Background Information

1. Course assessed:
   Course Discipline Code and Number: CEM 140
   Course Title: Organic and Biochemistry
   Division/Department Codes: PHY

2. Semester assessment was conducted (check one):
   Fall 2006
   ☒ Winter 20_07_
   ☐ Spring/Summer 20__

3. Assessment tool(s) used: check all that apply.
   ☐ Portfolio
   X 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.
   No

5. Indicate the number of students assessed/total number of students enrolled in the course.
   73/73

6. Describe how students were selected for the assessment.
   All sections were assessed

II. Results

1. Briefly describe the changes that were implemented in the course as a result of the previous assessment.
   No changes: This is the first assessment report for this course.

2. State each outcome (verbatim) from the master syllabus for the course that was assessed.
   Outcomes:
   a. Identify and name the major organic functional groups and their reaction products.
   b. Characterize the main biomolecules, carbohydrates, lipids, proteins, and nucleic acids, and their biological functions.
   c. Briefly outline metabolic pathways and their regulation in the body, e.g. citric acid cycle, electron transport chain, glycolysis etc.

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. ***Please attach a summary of the data collected.***

   The test given was an American Chemical Society standardized test consisting of 80 multiple-choice questions, split into 40 organic and 40 biochemistry. Tests were run on scantrons and average score for the various sections are recorded below, with an average overall of 79.09%
   Section 1& 2 76.22%
   Section 3 79.84%
   Section 4 84.09%

4. For each outcome assessed, indicate the standard of success used, and the percentage of students who achieved that level of success. ***Please attach the rubric/scoring guide used for the assessment.***
70% of students must score 70% or above on the ACS test. For this test 58/73 or 79.5% of students had a score above 70%.
Results for each of the three outcomes are summarized here and detailed on the excel spreadsheet attached. Each question was categorized as to outcome and scores totaled for each outcome. The scores were averaged for all sections.
Outcome 1: 77.53% success
Outcome 2: 79.5% success
Outcome 3: 73.17% success

5. Describe the areas of strength and weakness in students' achievement of the learning outcomes shown in assessment results.

   Strengths: All of the outcomes were met or exceeded.

   Weaknesses: N/A

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.

   No weaknesses found in student mastery of the outcomes.

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.
   a. **X** Outcomes/Assessments on the Master Syllabus
   Change/rationale: The course syllabus has not yet been updated, and the objectives given are those that will appear in the new syllabus as of Fall 2007.

   b. ☒ Objectives/Evaluation on the Master Syllabus
   Change/rationale: New syllabus

   c. ☐ Course pre-requisites on the Master Syllabus
   Change/rationale:

   d. ☐ 1st 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? New syllabus this Fall 2007

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.

COURSE ASSESSMENT REPORT

The ACS test is an effective tool, and data can be compared to national norms if desired.

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

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: Winter 2010

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

Submitted by:

Name: Breege Corcoran Date: June 6th 2007
Print/Signature

Department Chair: Rob Hagood Date: June 6th 2007
Print/Signature

Dean: Marty Showalter Date: 6-11-07
Print/Signature

logged 6/7/07 sg

Please return completed form to the Office of Curriculum & Assessment, SC 247.

Approved by the Assessment Committee 10/10/06