

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Biology	237	BIO 237 04/29/2015- Microbiology
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Life Sciences	Anne Heise
Date of Last Filed Assessment Report		

I. Assessment Results per Student Learning Outcome

Outcome 1: Use correct terminology when referring to the major subcellular and molecular structures in bacteria and viruses.

- Assessment Plan
 - Assessment Tool: Short-answer and/or constructed response questions on unit exam and/or final
 - Assessment Date: Winter 2018
 - Course section(s)/other population: All
 - Number students to be assessed: 100%
 - How the assessment will be scored: item analysis
 - Standard of success to be used for this assessment: The average score on the outcome questions will be 75% or higher.
 - Who will score and analyze the data: department 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)
	2015	

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

# of students enrolled	# of students assessed
166	85

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 was piloting the use of an end-of-semester comprehensive makeup exam as a platform for asking the questions used in assessment. Since this was a pilot, I asked the Bio 237 instructors to participate on a voluntary basis. Only one instructor agreed. So the assessment is based on the student in her two sections, plus the students in my two sections.

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 were in daytime sections on main campus. There are no MM or DL sections of this class.

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

The tool was a comprehensive makeup exam. Five questions - two true/false and three multiple choice - were used to assess this outcome. The exams were graded by scantron and the questions were analyzed using the scantron item analysis feature.

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

Overall 72% of the answers were correct.

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

If you look question by question for this outcome, it appears that overall students did well... until you get to questions 11 and 12. My sections did fine on those questions but others did not. In the case of question 11, it is worded in a way my students are used to but the other instructor's were not. In the case of question 12, the other instructor tells me she did not stress that particular fact with her students.

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.

Instructors may wish to highlight the nature of the cell wall in acid fast bacteria.

Outcome 2: Recognize and/or describe fundamental principles of molecular genetics.

- Assessment Plan
 - Assessment Tool: Short-answer and/or constructed response questions on unit exam and/or final
 - Assessment Date: Winter 2018
 - Course section(s)/other population: All
 - Number students to be assessed: 100%
 - How the assessment will be scored: item analysis
 - Standard of success to be used for this assessment: The average score on the outcome questions will be 75% or higher.
 - Who will score and analyze the data: department 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)
	2015	

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

# of students enrolled	# of students assessed
166	85

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 was piloting the use of an end-of-semester comprehensive makeup exam as a platform for asking the questions used in assessment. Since this was a pilot, I asked the Bio 237 instructors to participate on a voluntary basis. Only one instructor agreed. So the assessment is based on the student in her two sections, plus the students in my two sections.

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 were in daytime sections on main campus. There are no MM or DL sections of this class.

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

The tool was a comprehensive makeup exam. Five questions - two true/false and three multiple choice - were used to assess this outcome. The exams were graded by scantron and the questions were analyzed using the scantron item analysis feature.

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

Overall 62% of the answers were correct.

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

Students did fine on the very straightforward True/False assessment questions and on question 14, which again is a very straightforward multiple choice question. The other two multiple choice questions used for this outcome were subtle; the other instructor called one of them "tricky". It is possible the students overall actually know more about the genetic code than the assessment can demonstrate because students may have struggled with the logical structure of the questions.

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.

Personal observation makes me believe many students overall have a fairly shaky understanding of basic molecular genetics. We may decide to spend more time on the topic, and we can also either rewrite the assessment questions or offer more advance practice in how to tackle "tricky" questions.

Outcome 3: Describe patterns of infectious disease prevalence and transmission in a population of hosts.

- Assessment Plan
 - Assessment Tool: Short-answer and/or constructed response questions on unit exam and/or final

- Assessment Date: Winter 2018
- Course section(s)/other population: All
- Number students to be assessed: 100%
- How the assessment will be scored: The assessment will be scored using an answer key. Item analysis will take place.
- Standard of success to be used for this assessment: The average score on the outcome questions will be 75% or higher.
- Who will score and analyze the data: department 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)
	2015	

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

# of students enrolled	# of students assessed
166	85

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 was piloting the use of an end-of-semester comprehensive makeup exam as a platform for asking the questions used in assessment. Since this was a pilot, I asked the Bio 237 instructors to participate on a voluntary basis. Only one instructor agreed. So the assessment is based on the student in her two sections, plus the students in my two sections.

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 were in daytime sections on main campus. There are no MM or DL sections of this class.

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

The tool was a comprehensive makeup exam. Five questions - two true/false and three multiple choice - were used to assess this outcome. The exams were graded by scantron and the questions were analyzed using the scantron item analysis feature.

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>
Overall, 90% of the answers were correct.

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

This outcome requires knowledge of vocabulary. The questions were straightforward and the students did great.

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.

When I look at the questions I used for this outcome, I see one that I would like to rewrite; I can see how students might pick one of the distractors if they constructed a particular chain of events in their minds.

Outcome 4: Describe major mechanisms of pathogenesis within the human body and the body's major defenses against infectious disease.

- Assessment Plan
 - Assessment Tool: Short-answer and/or constructed response questions on unit exam and/or final
 - Assessment Date: Winter 2018
 - Course section(s)/other population: All
 - Number students to be assessed: 100%
 - How the assessment will be scored: item analysis
 - Standard of success to be used for this assessment: The average score on the outcome questions will be 75% or higher.
 - Who will score and analyze the data: department 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)
	2015	

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

# of students enrolled	# of students assessed
166	85

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 was piloting the use of an end-of-semester comprehensive makeup exam as a platform for asking the questions used in assessment. Since this was a pilot, I asked the Bio 237 instructors to participate on a voluntary basis. Only one instructor agreed. So the assessment is based on the student in her two sections, plus the students in my two sections.

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 were in daytime sections on main campus. There are no MM or DL sections of this class.

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

The tool was a comprehensive makeup exam. Ten questions - four true/false and six multiple choice -- were used to assess this outcome. The exams were graded by scantron and the questions were analyzed using the scantron item analysis feature.

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
Overall, 82% of the answers were correct.

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

This outcome is absolutely huge and once this assessment has worked its way through the system I plan to separate this outcome into two outcomes. Overall students were successful on this outcome. They did very well on the questions related to pathogenesis and not as well on questions related to immunity.

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 question with the worst performance was #22. I don't have a way of checking this hypothesis, but I would not be surprised if a lot of students chose the answer that includes "kill the toxin" instead of "neutralize the toxin". I stress that toxins aren't alive and thus can't be killed, but I know that students think casually about the immune system killing toxins.

Outcome 5: Demonstrate proficient use of the microscope and preparation of high-quality slides of bacteria.

- Assessment Plan
 - Assessment Tool: Skills checklist
 - Assessment Date: Winter 2018
 - Course section(s)/other population: all
 - Number students to be assessed: all
 - How the assessment will be scored: departmentally-developed rubric
 - Standard of success to be used for this assessment: 75% will score 4 or better on a 5 pt scale.
 - Who will score and analyze the data: department 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)
	2015	

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

# of students enrolled	# of students assessed
166	92

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.

There were 7 sections of Bio 237 offered in Winter 2015. I asked for instructors to volunteer to participate in assessment, because the method I planned to use was a pilot. 4 of 7 sections participated.

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.

Participation was voluntary (see above). The 4 sections that participated were all day students on campus.

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

Skills checklist using a rubric (attached). Scoring done by lab instructor. Maximum possible score was 10, minimum was 0.

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

83 out of 92, or 86% of assessed students, scored an 8 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 are able to prepare good quality microscope slides.

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.

Performance could be improved if we had better microscopes.

Outcome 6: Use basic aseptic techniques in the microbiology lab.

- Assessment Plan
 - Assessment Tool: Skills checklist
 - Assessment Date: Winter 2018
 - Course section(s)/other population: all
 - Number students to be assessed: all
 - How the assessment will be scored: departmentally-developed rubric

- Standard of success to be used for this assessment: 75% will score 4 or better on a 5 pt scale.
- Who will score and analyze the data: department 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)
	2015	

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

# of students enrolled	# of students assessed
166	0

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.

This outcome was not 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.

N/A

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

N/A

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
N/A

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

This outcome was not assessed.

- 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.

This outcome was not assessed.

II. Course Summary and Action Plans Based on Assessment Results

- 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 results are not surprising to me.

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

I will share the results with department faculty in Fall 2015.

- Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Outcome Language	I plan to split Outcome 4 into two Outcomes. I plan to combine Outcomes 5 and 6 into one lab-based outcome.	Outcome 4 is about both the production of infection/disease, and the body's innate and adaptive immune responses to infection. That is way too much. We may also decide to write a set of common questions that all instructors in all sections are required to embed in their exams. I would do this in consultation with the part-time faculty who teach this class. Using an end-	2016

		of-term exam is only convenient for instructors who want to offer a makeup exam to their students. I like having such an exam but not all instructors do.	
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4. Is there anything that you would like to mention that was not already captured?

Jennifer Pruette volunteered to have her sections participate in this assessment. Tamara Tucker collected information for one of Jennifer's labs, and Jennifer collected the information for the other lab. Karen Paelicke collected the information for both of Anne Heise's lab sections. Anne wrote the questions used on this assessment.

III. Attached Files

[Questions and Rubric Analysis by question](#)

Faculty/Preparer: Anne Heise **Date:** 05/07/2015
Department Chair: Anne Heise **Date:** 05/07/2015
Dean: Kristin Good **Date:** 05/11/2015
Assessment Committee Chair: Michelle Garey **Date:** 06/15/2015

COURSE ASSESSMENT REPORT

I. Background Information

1. Course assessed:
 Course Discipline Code and Number: Bio 237
 Course Title: Microbiology
 Division/Department Codes: MNSB

2. Semester assessment was conducted (check one):
 Fall 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.

Unit exams were used on the last assessment but many of the questions are new.

5. Indicate the number of students assessed/total number of students enrolled in the course.
 Two double sections of Bio 237 were assessed, for a total of about 90 students (92 on Exam 1 down to 86 on Exam 5).

6. Describe how students were selected for the assessment.
 All students in Anne Heise's lecture sections were assessed.

II. Results

1. Briefly describe the changes that were implemented in the course as a result of the previous assessment.

The previous assessment showed that the course was working reasonably well. At least 77% of students had satisfactory performance on each objective. I continue to modify test questions that significant percentages of students find confusing or misleading; I continue to try new homework or in-class exercises to drill on challenging concepts, molecular genetics in particular. Lab skills were at a satisfactorily high level, so I have not changed much in the lab.

List each outcome that was assessed for this report exactly as it is stated on the course master syllabus.

Outcome 1: Use correct terminology when referring to the major subcellular and molecular structures in bacteria and viruses.

Outcome 2: recognize and/or describe fundamental principles of molecular genetics.

Outcome 3: Describe patterns of infectious disease prevalence and transmission in a population of hosts.

Outcome 4: Within the human body, describe major mechanisms of pathogenesis, and the body's major defenses against infectious disease:

COURSE ASSESSMENT REPORT

2. 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.*

I gave 5 unit exams during the Fall 2009 semester. For each exam, I identified questions that could be used to assess the four outcomes above. I used at least 5 questions to assess each outcome. I used the item analysis feature with the Scantron reader to find out what percent of students got each assessment question right. Then I averaged the percent correct for all assessment questions related to each outcome. See attachment for data summary.

Outcome	# questions used for assessment	average % of students answering correctly, over all questions	Success?
Outcome 1	9	86%	Yes
Outcome 2	5	64	No
Outcome 3	7	86	Yes
Outcome 4	15	80	Yes

3. 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.*

The standard of success for all 4 outcomes was 70% correct answers, averaged over all questions and all students. This standard was set in the master syllabus.

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

Strengths:

Student achievement was strong in all areas except molecular genetics. I believe the scores are a bit artificially low for outcome 2, based on anecdotal feedback that one of the questions I used for assessment was "confusing".

Weaknesses: The major weakness is molecular genetics.

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.

Exam questions can be revised. More varieties of instruction can be tried such as videos, in-class group work, extensive homeworks. I would also like to try to get the classes that are pre-requisites to Bio 237 to spend more time on genetics. I may try doing a pre-test kind of survey when starting this material to get a better sense of what students do and do not understand, so I can adjust how much time I spend on each topic.

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.

As mentioned above, I will probably modify exam questions, course assignments, teaching methods and instructional activities. These are not drastic changes that require a lengthy rationale.

- a. Outcomes/Assessments on the Master Syllabus
Change/rationale:

COURSE ASSESSMENT REPORT

- b. Objectives/Evaluation on the Master Syllabus
Change/rationale:
- 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? Begin in Winter 2010.

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.

Tool was adequate.

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

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

All _____ Selected X

If "All", provide the report date for the next full review: 3 years from acceptance _____

If "Selected", provide the report date for remaining outcomes: June 2010

Submitted by:

Print: Anne Heise
Faculty/Preparer

Signature Anne Heise Date: 1-14-10

Print: Marvin Boluyt
Department Chair

Signature Marvin Boluyt Date: 1/14/10

Print: Martha Showalter
Dean/Administrator

Signature Martha Showalter Date: JAN 19 2010

logged 1/21/10 sjv
Approved by the Assessment Committee 11/08

COURSE ASSESSMENT REPORT

Background Information

I. Course assessed:

Course Discipline Code and Number: Bio 237

Course Title: Microbiology

Division Code: MBNS Department Code: LIF

II. Semester assessment was administered (check one):

- Fall 20__
- Winter 2006
- Spring/Summer 20__

III. Assessment tool used (check one):

Please attach a copy of the tool and scoring rubric used.

- Portfolio
- Standardized test
- Other external certification/licensure exam (please describe): _____
- Survey
- Prompt
- Departmental exam
- Capstone experience (please describe): _____
- Other (please describe): Questions on unit exams; lab skill checks

Has this tool been used before?

- Yes
- No

If yes, has this tool been altered since its last administration? If so, briefly describe changes made.

A few of the questions are not exactly the same as those submitted with the master syllabus as sample questions.

IV. Please list the section(s) in which this tool was administered:

CRNs 11804, 10481, 11661

V. How many students were assessed? 63 - 69

COURSE ASSESSMENT REPORT

Results

I. Briefly describe assessment results based on data collected for the course assessed, demonstrating to what extent students are achieving the learning outcomes as found in the master syllabus (see attached).
Please attach any data collected.

See attached. Students met expectations for Outcomes 1 – 5. I forgot to do Outcome 6.

II. Based on the outcomes outlined in the master syllabus for the course assessed, did students meet expectations of the learning outcomes of that course?

Yes
 No

Percentage of students meeting outcomes: at least 77%

III. What areas of strength and weakness in students' achievement of the learning outcomes of the assessed course (as stated in the master syllabus) did assessment results show?

Strengths: All areas of Outcome 3 were strengths.

Lab skills were good.

Weaknesses: Students are baffled by the genetic code.

COURSE ASSESSMENT REPORT

Changes influenced by assessment results

I. If weaknesses were found (see III above) or students did not meet expectations, what action will be taken to address this?

A new homework on the genetic code will be developed.

II. Identify any other 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.

Master syllabus

Description and rationale: _____

Curriculum

Description and rationale: _____

Course syllabus

Description and rationale: _____

Course assignments

Description and rationale: _____

Course materials (check all that apply)

Textbook

Handouts

Other: _____

Description and rationale: _____

Teaching methodology

Description and rationale: _____

X Other: Outcomes 5, 6.

Description and rationale: Students will be told the criteria used to grade these outcomes. I hope this will help them understand their grade, and help them understand what to aim for in their lab preparations.

COURSE ASSESSMENT REPORT

Future plans

I. Was the assessment tool used effective in measuring student achievement of learning objectives for this course? If not, why?

Reasonably so. Overall scores are very high. I would probably learn more if more students
_____ were unsuccessful.

II. If the assessment tool was not effective, what changes will be made in future assessments?

Submitted by:

Name: Anne Heise *Anne Heise* Date: 5/01/2006

Department Chair: Esta Grossman and Bill Nevers *Esta Grossman* Date: 5/11/06

Dean: M. Shover Date: 6/15/06

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