

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Physics	211	PHY 211 08/12/2019- Analytical Physics I
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Physical Sciences	Danette Bull
Date of Last Filed Assessment Report		

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

Yes

The last known assessment for PHY211 was during Winter 2010.

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

The average score for the two assessed outcomes was 2.77 out of 4.0 for an overall success rate of 83%.

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

No particular changes were implemented after the last assessment, as the success rate met or exceeded the standard. At the time of the last PHY211 assessment, the same faculty member taught both sections of the course, and that faculty member has since retired (Kapp).

II. Assessment Results per Student Learning Outcome

Outcome 1: Apply the appropriate physical principles to solve problems pertaining to Mechanics, Wave motion and Heat

- Assessment Plan
 - Assessment Tool: Written Exam
 - Assessment Date: Winter 2018
 - Course section(s)/other population: All Sections

- Number students to be assessed: Random selection of students from all sections
- How the assessment will be scored: Departmentally-developed rubric
- Standard of success to be used for this assessment: 75% of the students should achieve a score of 2.5 out of 4 or better per question.
- Who will score and analyze the data: Departmental full-time Physics faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

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

# of students enrolled	# of students assessed
64	43

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.

The drop-down list to select the term that was assessed did not include Spring/Summer 2019, which is when the assessment data was collected. I selected the nearest term to that, which was Winter 2019. Spring/Summer 2019 only had two sections of PHY211, so there were 43 students assessed instead of 64 (Winter 2019 had three sections of PHY211)

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.

Three written quizzes were created for assessment purposes, and the quizzes were given at the appropriate times for both class sections. Quiz #1 covered mechanics, Quiz #2 covered vibrations/waves and Quiz #3 covered fluids/thermo.

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

A 4.0-point assessment rubric was created to score the quizzes (rubric shown below), and two full-time physics faculty independently scored the three quizzes. The data from each instructor was compiled into a summarized spreadsheet.

- 1 – Student showed no work or understanding of material
- 2 – Student showed work and some understanding, but did not complete all the work
- 3 – Student showed understanding of the material but did not complete all the work properly
- 4 – Student showed understanding of material and did the proper work

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

Quiz #1: the average score was 3.302 out of 4.0 with 37 of 43 students scoring a 3 or 4 (86%).

Quiz #2: the average score was 3.733 out of 4.0 with 40 of 43 students scoring a 3 or 4 (93%).

Quiz #3: the average score was 3.671 out of 4.0 with 39 of 41 students scoring a 3 or 4 (95%).

The standard of success was met, as more than 75% of the students scored above 2.5 on the 4.0-point rubric for each of the written quizzes.

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

Most students scored well on the three assessment quizzes. The simple harmonic motion quiz (Quiz #2 in the vibrations/waves section of the class) had the best success rate, which was exciting to see since it not only required students to perform the appropriate calculations but they also had to sketch a graph to represent the position as a function of time for the object. Being able to successfully complete the calculations as well as the graph definitely indicates a firm understanding of the material.

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 standards of success were met for all quizzes. The most significant activity to ensure continuous improvement is to be sure that all instructors (both part-time and full-time) are consistent in their coverage of the material. This requires

frequent and consistent communication with current instructors and also making sure that new instructors are supplied with all the appropriate information and are provided continued support throughout the semester.

Outcome 2: Collect data, perform calculations and draw conclusions based on the results of the calculations.

- Assessment Plan
 - Assessment Tool: Laboratory reports
 - Assessment Date: Winter 2018
 - Course section(s)/other population: All Section
 - Number students to be assessed: Random selection of students from all sections
 - How the assessment will be scored: Departmentally-developed rubric
 - Standard of success to be used for this assessment: 75% of the students should achieve a score of 75% or higher
 - Who will score and analyze the data: Full time Physics faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

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

# of students enrolled	# of students assessed
64	43

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.

The actual assessment term was Spring/Summer 2019 but that option was not available in the drop-down list of terms. Spring/Summer 2019 term had two sections of PHY211 instead of three sections in Winter 2019.

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.

Two labs were selected to be assessed, and the labs were conducted at the appropriate times for each class section. Lab #1 was for mechanics and Lab #2 was for vibrations/waves

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

A 4.0-point rubric was used to assess the lab reports (rubric shown below). Two full-time Physics faculty independently graded the lab submissions based on the rubric, then a summary spreadsheet was compiled.

1 – Student showed no work or understanding of material

2 – Student showed work and some understanding, but did not complete all the work

3 – Student showed understanding of the material but did not complete all the work properly

4 – Student showed understanding of material and did the proper work

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

Lab #1: the average was 3.625 out of 4.0 with 89% of the submissions scoring 3 or 4.

Lab #2: the average was 3.660 out of 4.0 with 90% of submissions scoring 3 or 4.

The standard of success was met for this outcome as more than 75% of the students scored 75% or higher.

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

Most students performed well in the lab activities and the associated calculations and lab reports. The labs are a hands-on method of bringing the theoretical concepts to life and are a valuable tool in helping to solidify the concepts.

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 standard of success was met, but continuous improvement can be achieved by ensuring that all instructors are conducting the same types of labs. Just as with the first learning outcome area, frequent and consistent communication between all instructors is important, and providing adequate support for new instructors is critical.

III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

The only intended change offered in the last assessment was to possibly allow for more time and more problem solving in the last section of the course. While having sufficient time for everything is still a challenge as the course covers so much material, the assessment in the fluids/thermo section of the class revealed adequate student success rates, so the material is being adequately covered.

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

The assessment outcomes indicate that most students are successful in the class. The students who take PHY211 are often engineering students who move on to take PHY222, and the success rate in that class is also an indicator that the prerequisite PHY211 is meeting the needs of students.

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

Once the assessment reporting is complete, all full-time physics faculty and the Physical Science department chair will be notified of the completion. During future department meetings, the emphasis to ensure consistent course content and support for new instructors will be discussed.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Other: Instructor collaboration	Maintain consistent communication between instructors and provide adequate support for new instructors.	This is critical to ensure instructors are consistent in their coverage of the course material	2020

		and the types of labs they conduct.	
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5. Is there anything that you would like to mention that was not already captured?

While the current assessment data indicates that PHY211 is successfully meeting the assessment standards with good student outcomes, it remains important to ensure that all sections are being taught in a consistent manner, both from a lecture and lab approach. In the past, with just one instructor teaching both sections each semester, consistency was not a concern. With the physics discipline continuing to grow and offering more sections each semester, it is crucial to ensure that all full-time and part-time instructors are adequately covering all material and are consistent in their lab offerings. To ensure this, frequent communication is necessary, and continuous support for new instructors is essential.

III. Attached Files

[PHY 211 Assessment Data Spr/Su 2019](#)

Faculty/Preparer: Danette Bull **Date:** 08/13/2019
Department Chair: Suzanne Albach **Date:** 08/13/2019
Dean: Victor Vega **Date:** 09/26/2019
Assessment Committee Chair: Shawn Deron **Date:** 12/04/2019

COURSE ASSESSMENT REPORT

I. Background Information

1. Course assessed:

Course Discipline Code and Number: PHY 211
 Course Title: Analytical Physics I
 Division/Department Codes: MSH

2. Semester assessment was conducted (check one):

- Fall 20__
- X Winter 2010
- Spring/Summer 20__

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

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

4. Have these tools been used before?

- Yes
- X 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 and the total number of students enrolled in the course.

Total number of students in two sections of the class was 42. 36 students were assessed > 85% of the class.

6. If all students were not assessed, describe how students were selected for the assessment. *(Include your sampling method and rationale.)*

All students who were taking PHY 211 in the winter 2010 semester and present in the class week 15 of the semester were given the assessment exam.

II. Results

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

There were no changes

2. List each outcome that was assessed for this report exactly as it is stated on the course master syllabus. *(You can copy and paste these from CurricUNET's WR report.)*

- I. Identify and recognize concepts and principles related to mechanics, vibration, and thermodynamics.
- II. Apply appropriate physical principles to solve problems, as relates to mechanics, vibration and thermodynamics.

3. For each outcome that was assessed, indicate the standard of success exactly as it is stated on the course master syllabus. *(You can copy and paste these from CurricUNET's WR report.)*

The standard of success was set that the mean of all students assessed would be 2.0 or higher.

4. Briefly describe assessment results based on data collected during the course assessment. Indicate the extent to which students are achieving each of the learning outcomes listed above and state whether the standard of success was met for each outcome. ***In a separate document, include a summary of the data collected and any rubrics or scoring guides used for the assessment.***

See attached report

COURSE ASSESSMENT REPORT

Overall result: The overall mean for both outcomes for all students was 2.77. The overall % success rate for both outcomes combined was 83%. (30/36 achieved a score of 2 or higher = 83%)

Item analysis for each topic for each outcome:

Outcome	% of students who were successful (scored 2 or higher)
Outcome I	29/36 = 80%
Outcome II	24/36 = 68%

- Describe the areas of strength and weakness in students' achievement of the learning outcomes shown in the assessment results. *(This should be an interpretation of the assessment results described above and a thoughtful analysis of student performance.)*

Strengths: 83% of all students taking this class appear to have met or exceeded the learning outcomes for this course.

Weaknesses: Item analysis shows that roughly 8/36 students = 22% had difficulty with applying physical principles to solve problems in the areas of vibration and thermodynamics. Needless to say, this is the most difficult part of the course. As well, these topics are the last to be covered in the semester and therefore most affected by the simple reality of "end-of-semester-burn-out" which does seem to have an effect. I also believe that student attendance begins to play a big role in student success at this point in every semester. See discussion below.

III. Changes influenced by assessment results

- If weaknesses were found (see above) or students did not meet expectations, describe the action that will be taken to address these weaknesses. *(If students met all expectations, describe your plan for continuous improvement.)*

With an overall success rate of 83%, I would just continue to teach as I have in the past. At this point, changes do not seem to be indicated based on the data collected and student performance on the assessment exam except as noted above. It is always a challenge to teach this level of course and to keep the students fresh. The material progresses at a fast and relatively challenging pace, and so balancing all that must be covered and student's successful engagement with the material is something I continue to struggle with (as do they). Most of the components of the course cannot really be changed, so I will focus on demonstrating more problems to/with students and trying to create more problems for them to work on as well. On the otherhand...

Class size was 24 or less. Classes of this size give the instructor the ability to get to know each student very well. It became clear over the semester that a few students were simply not doing the work. Their attendance was intermittent, they did not attempt the homework, and they did not really study the material. For the most part, these are the students who were not successful. Not a big surprise and not really something that is easily reflected in the design of this reporting instrument!

On the other extreme, most of the students did attend class and did study the material and not only attempted but did the homework assignments. These, of course, are the students who did well in the course. I keep in touch with a large number of students who have taken this course, and then gone on to the University of Michigan to complete their engineering degrees. All have indicated that the workload at the university seems "impossible" when they first transfer, yet they were well prepared to accomplish this workload as a result of this course, and others taken at Washtenaw Community College. Their math, Chemistry and Physics backgrounds are superior. They all view their education at Washtenaw Community College as more than meeting their needs to succeed at the U of Michigan.

All of this information taken together informs my own assessment of the course and any need for changes I might make. At this point, I would say that for the students who try there is every indication that this course meets their needs and that they are very likely to succeed both in the course and in their future education.

COURSE ASSESSMENT REPORT

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. 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. 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: possibly more time/more problems for the last topics of the course

3. What is the timeline for implementing these actions? Winter 2012

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.

They were extremely useful in assessing the students' mastery of the subject matter.

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 X Selected _____

If "All", provide the report date for the next full review: Winter 2015

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

Submitted by:

Print: George Kapp
Faculty/Preparer

Signature

Date:

2/16/12

Print: Kathleen Butcher
Department Chair

Signature

Date:

11/28/2011

Print: Martha A. Showalter
Dean/Administrator

Signature

Date:

12/2/11