

**Course Assessment Report  
Washtenaw Community College**

Discipline	Course Number	Title
Physics	111	PHY 111 10/06/2016- General Physics I
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Physical Sciences	Robert Hagood
Date of Last Filed Assessment Report		

**I. Assessment Results per Student Learning Outcome**

Outcome 1: Identify and recognize concepts and principles related to kinematics, force, work/energy, impulse/momentum, angular kinematics, torque, angular energy, angular momentum, equilibrium, elasticity, temperature and heat, waves motion and sound.

- Assessment Plan
  - Assessment Tool: Departmental final exam
  - Assessment Date: Fall 2006
  - Course section(s)/other population: Random sample from all sections
  - Number students to be assessed: 10% of all students from each section offered in the Fall semesters
  - 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)
2015		

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

# of students enrolled	# of students assessed
162	120

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 was the number of students who took the test. All classes were assessed, but only 120 students who were still in the class (42 students seemed to have stopped coming to the class).

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 who took PHY 111, Fall 2015, were given the assessment.

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

The students were given a department exam which had questions to assess if students could identify concepts in Physics, Kinematics, Temperature and Heat, and finally Wave Motion.

Students were asked questions on these concepts, the questions were graded as either right, 4 points, or wrong, 1 point. This is a fairly straightforward approach to grading these types of questions.

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 students did well on this learning outcome. The overall results are that the students did achieve the desired learning outcome level of 75% for all students. For each area, here is the individual level of achievement.

Kinematics: 75.9 %

Temperature and Heat: 99.1%

Wave Motion: 79.7 %

What this shows the department is that the students are understanding and learning the different concepts taught in the course.

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

The students show a strong understanding of the concepts in general, but they were very strong on Temperature and Heat. Of course, this is the last topic taught in the class and was the topic that was most fresh in their minds.

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.

Overall, the students did meet the desired level of the outcome, but within the course, the identification of the concepts seems to be an area where more instruction time needs to be spent.

Outcome 2: Apply appropriate physical principles to solve problems.

- Assessment Plan
  - Assessment Tool: Departmental final exam
  - Assessment Date: Fall 2006
  - Course section(s)/other population: Random sample from all sections
  - Number students to be assessed: 10% of all students from each section offered in the Fall semesters
  - 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)
2015		

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

# of students enrolled	# of students assessed
162	120

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.

Not all students completed the course or stopped coming to class, so we were unable to assess them.

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.

Every students from every section of PHY 111 that was offered in the Fall of 2015 were given the department assessment exam.

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

The tool was an exam, where the students were required to demonstrate the ability to identify concepts in physics and solve physics problems from related topics.

For the solved problems, the students were given scores based on the method they used to solve a problem. In physics, a properly solved problem has 4 basic components:

1: Diagram of the question asked with known and unknown variables listed.

2: Selection of the Proper Principle of physics, most time this is an equation.

3: Solving the equation, with Algebra and Trig. to get the proper algebraic solution.

4: Final answer with proper units.

So each problem was graded on a 1- to 4-point scale. If all steps were followed properly, students received a score of 4, if not, then the score the student received is based on the amount of proper work they did in solving the problem.

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 results for this test were very good. Overall, the students demonstrated a high level of achievement with their ability to solve physics problems. For Kinematics,

the overall percentage for all 120 students was 90.8%, for Temperature and Heat. The overall percentage for all 120 students was 87.1%, for Wave Motion, the overall percentage for all 120 students was 91.4%.

These results far surpass the requirements for the learning outcome for the course. For the course, we were hoping to achieve a level of at least 75% for all students who took the assessment.

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

Overall, the students showed that they are achieving, at a very high rate, this learning outcome. The design of the course seems to help students gain the tools needed to solve problems in physics.

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.

With the outstanding success of the students in this section, helping the students to continue to improve will happen with more training for the faculty. New faculty need to be given training to help them help the students.

## II. Course Summary and Action Plans Based on Assessment Results

1. 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?

Overall, this assessment has shown that the course is helping students learn the concepts and problem solving techniques for general physics. What does show a little concerns is the number of students who did not understand the concepts of physics that are covered in the course. There is not a problem with individual classes or instructors, but from the data, it can be seen that the concepts scores seem to drop with time. Kinematics is the first material that is taught in the course, and this area had the lowest scores when it came to students being able to identify these concepts, where Temperature and Heat, the last subject taught in the course, had the highest identification score.

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

All information and data has been shared with all faculty already, the action plan will be shared upon completion of this report.

3.

Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Other: Master Syllabus	Master syllabus will be updated to better match the learning outcomes.	The master syllabus was updated, but the proper changes were some how not made properly, somewhere along the line learning outcomes were changed from what the physics department input.	2017

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

5.

### III. Attached Files

[PHY 111\\_Assessment Data](#)

**Faculty/Preparer:** Robert Hagood **Date:** 10/26/2016

**Department Chair:** Kathleen Butcher **Date:** 11/03/2016

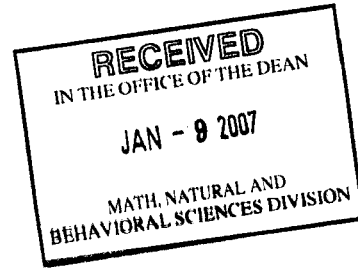
**Dean:** Kristin Good **Date:** 11/04/2016

**Assessment Committee Chair:** Michelle Garey **Date:** 12/15/2016

**COURSE ASSESSMENT REPORT**

**I. Background Information**

1. Course assessed:  
 Course Discipline Code and Number: PHY 111  
 Course Title: General Physics I  
 Division/Department Codes: MNB



2. Semester assessment was conducted (check one):  
 Fall 2006  
 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.

5. Indicate the number of students assessed/total number of students enrolled in the course.  
 The total enrollment of students in the course was 112 students. 10.7 % of possible students were assessed.

6. Describe how students were selected for the assessment.  
 For each of the six sections of the PHY 111 course, two students were drawn at random from all the assessment tests.

**II. Results**

1. Briefly describe the changes that were implemented in the course as a result of the previous assessment.  
 This was the first assessment of this course. Previously, the course was only changed based on the instructor and department input.
2. State each outcome (verbatim) from the master syllabus for the course that was assessed.
  1. Identify and recognize concepts and principles related to Mechanics, Heat, and Vibration and Waves
  2. Apply appropriate physical principles to solve problems, as related to Mechanics, Heat, and Vibration and Waves.
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.*  
 There were six questions asked of each student. Three questions ask the students to identify concepts of Mechanics, Heat and Vibrations and Waves. Three questions ask the students to solve problems in the three topic areas.  
 For the identifying questions the students score as follows
  1. Mechanics – 7 students answered the question correctly
  2. Heat - 10 students answered the question correctly
  3. Vibrations and Waves - 12 students answered the question correctly

**COURSE ASSESSMENT REPORT**

For the problem solving part of the test, the students were scored on a scale of 1 to 4; this is the department's rubric. The following are the average scores for each section of the test

- 4. Mechanics – 3.41
- 5. Heat – 3.16
- 6. Vibrations and Waves – 3.58

- 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.*

The standard of success for the identification of physics concepts was a correct answer

- 1. Mechanics – 58% of students. It should be noted that in one course section a formatting error occurred with the questions, if these students are set aside, then 70% of the students correctly answered the question.
- 2. Heat – 83 % of the students.
- 3. Vibrations and Waves - 100 % of the students.

For the problem solving part, a score of 3 was the benchmark for a student the mastered the material.

- 4. Mechanics – 83.3% of the students.
- 5. Heat – 75 % of the students.
- 6. Vibrations and Waves - 83.3% of the students.

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

Strengths: The students did a great job of understanding the material and answering the assessment questions properly. The students identified and solve the problems as is expected of them.

Weaknesses: Some of the students did have a weakness in identifying the concepts of physics.

**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.

Each section will work to help that students better identify the concepts of physics and see the relationship between the concepts of physics and how they able to problem solving.

- 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.  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: More emphasis on the concepts of physics. This will be done at the course level.



**COURSE ASSESSMENT REPORT**

h.  Individual lessons & activities  
Change/rationale:

3. What is the timeline for implementing these actions? To have the instructor start the emphasis in the winter 2006 semester.

**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 tool gave the department a better understanding of the students achievement and what areas that they were lacking.

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: The next course review is scheduled for the Fall of 2009, a three year cycle.

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

**Submitted by:**

Name: Robert Hagood [Signature] Date: 1/5/07  
Print/Signature

Department Chair: Robert Hagood [Signature] Date: 1/5/07  
Print/Signature

Dean: Marta Showalter [Signature] Date: JAN - 9 2006  
Print/Signature