

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Physics	111	PHY 111 10/25/2021- General Physics I
College	Division	Department
	Math, Science and Engineering Tech	Physical Sciences
Faculty Preparer		Amir Fayaz
Date of Last Filed Assessment Report		12/15/2016

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

10/06/2016 using data collected Fall 2015.

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

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.

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

The master syllabus was updated to better reflect what was being taught and assessed in the course.

II. Assessment Results per Student Learning Outcome

Outcome 1: Identify and recognize concepts and principles related to mechanics, wave motion and sound, temperature and heat.

- Assessment Plan

- Assessment Tool: Outcome-related final exam questions
- Assessment Date: Fall 2019
- Course section(s)/other population: All sections
- Number students to be assessed: All students
- How the assessment will be scored: Concept questions will be given 1 point if correct and zero points if incorrect. Problems will be based on 4 points as follows: 0 - did nothing; 1 - started problem, but not correct method; 2- started problem and had the correct approach; 3 - did most of the problem correctly, a small error; 4 - problem correctly solved.
- Standard of success to be used for this assessment: 70% of all students taking the assessment test will score at least 75%
- Who will score and analyze the data: All 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)
2021		

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

# of students enrolled	# of students assessed
137	104

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 104 students who were still in the class (33 students seemed to have stopped coming to the class or have withdrawn from 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 present in all sections in Fall 2021 were given the assessment test.

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 Mechanics-Kinematics, Temperature and Heat, and Wave Motion.

The questions were graded as follows:

0 - did nothing

1 - started

2 - started problem and had the correct approach

3 - did most of the problem correctly, with a small error

4 - problem correctly solved

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, the individual level of achievement was as follows:

Mechanics-Kinematics: 82.7 %

Temperature and Heat: 92.3%

Wave Motion: 85.6 %

90/104 students (87%) scored 75% or higher. This shows the students are understanding and learning the desired concepts taught in the course well.

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, and they were very strong on Temperature and Heat. Perhaps, 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. In the future, the students should solve more problems, especially to improve performance in the area of Mechanics and Kinematics.

Outcome 2: Apply appropriate physical principles to solve problems.

- Assessment Plan
 - Assessment Tool: Outcome-related final exam questions
 - Assessment Date: Fall 2019
 - Course section(s)/other population: All sections
 - Number students to be assessed: All students
 - How the assessment will be scored: Concept questions will be given 1 point if correct and zero points if incorrect. Problems will be based on 4 points as follows: 0 - did nothing; 1 - started problem, but not correct method; 2 - started problem and had the correct approach; 3 - did most of the problem correctly, a small error; 4 - problem correctly solved.
 - Standard of success to be used for this assessment: 70% of all students taking the assessment test will score at least 75%
 - Who will score and analyze the data: All 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)
2021		

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

# of students enrolled	# of students assessed
137	104

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 just stopped coming to class, so we were unable to assess them all.

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 student from every section offered in the Fall of 2021 was 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, usually this is a Formula.
- 3: Solving the equation (Calculations), 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 overall average for all the students (104/137) who took the test was 84.9%. This result far surpasses the requirements for the learning outcome for the course.

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

Outcome-related questions: The students showed a strong understanding of the ability to apply the concepts in general, and they were very strong on Temperature and Heat. Perhaps, this is the last topic taught in the class and was the topic that was most fresh in their minds.

Lab reports: The students show a very good understanding of the concepts and principles the labs presented. In general, all three areas were firmly grasped by the students based on their overall scores.

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.

In the future, the students should solve more problems, especially to improve performance in the area of Mechanics and Kinematics.

Outcome 2: Apply appropriate physical principles to solve problems.

- Assessment Plan
 - Assessment Tool: Lab Reports
 - Assessment Date: Fall 2019
 - Course section(s)/other population: All sections
 - Number students to be assessed: A random sample of 10 students from each section with a minimum of one full section
 - How the assessment will be scored: Departmentally-developed rubric using a scale of 0 - 4.
 - Standard of success to be used for this assessment: 70% of all students taking the assessment test will score at least 75%
 - Who will score and analyze the data: All 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)
2021		

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

# of students enrolled	# of students assessed
137	104

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. Some 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 student present in all sections offered during the Fall of 2021 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 students completed labs throughout the semester and were assessed by a couple of methods. Students either write lab reports to show their mastery of the lab concepts and principles, or students take a lab quiz to show their understanding of the lab concepts and principles. All students' scores were determined on a percentage basis. Not all instructors had the same number of students.

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

Of the 12 labs included in the lab assessment process over the course of the semester. The average scores were as follows:

Mechanics/Kinematics = 81.22%

Heat = 80.25%

Wave Motion = 89.53%

The total percentage score of 83.67% far exceeds the desired level of learning outcome.

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

Outcome-related questions: The students showed a strong understanding of the ability to apply the concepts in general, and they were very strong on Temperature and Heat. Perhaps, this is the last topic taught in the class and was the topic that was most fresh in their minds.

Lab reports: The students show a very good understanding of the concepts and principles the labs presented. In general, all three areas were firmly grasped by the students based on their overall scores.

- 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.

In the future, the students should solve more problems, especially to improve performance in the area of Mechanics and Kinematics.

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.

The updates to the master syllabus allowed a more accurate assessment of the course.

- 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?

Since the assessment was done during a "virtual" semester, the students were not actually able to participate in "hands-on" lab activities, but with the advent of simulated labs, some of the more difficult physics concepts were demonstrated even more efficiently using virtual labs. The outcomes were adequately met.

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

As soon as possible.

- Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
No changes intended.			

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

6.

III. Attached Files

[Lab assessment data](#)
[Assessment test results](#)

Faculty/Preparer:	Amir Fayaz	Date: 01/05/2022
Department Chair:	Suzanne Albach	Date: 01/11/2022
Dean:	Victor Vega	Date: 01/12/2022
Assessment Committee Chair:	Shawn Deron	Date: 03/16/2022

**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

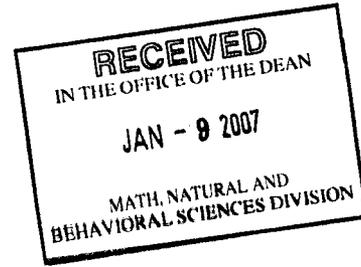
Dean: Kristin Good **Date:** 11/04/2016

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. 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: 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  Date: 1/5/07
 Print/Signature

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

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