

Course Assessment Report
Washtenaw Community College

| Discipline | Course Number | Title |
|--------------------------------------|---------------------------------------|--|
| Physics | 222 | PHY 222 07/21/2021- Analytical Physics II |
| College | Division | Department |
| | Math, Science and Engineering Tech | Physical Sciences |
| Faculty Preparer | | 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

Winter 2018 report using data collected Fall 2017.

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

On the assessment quiz, where all students in attendance were assessed, more than 75% of the students achieved the assessment goal of scoring at least 2.5 out of 4 on an assessment quiz according to a rubric created by department faculty. Also, for the lab assessment, a random sampling of lab reports from 25 students was assessed and graded on a scale of 0-10. More than 75% of the students scored the desired 75% or better on the lab reports.

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

No changes were implemented as a result of this previous assessment.

II. Assessment Results per Student Learning Outcome

Outcome 1: Apply the appropriate physical principles to solve problems pertaining to electricity, magnetism, light and modern physics.

- 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 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 |
|------------------------|------------------------|
| 85 | 71 |

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

By the time the cumulative assessment quiz was given during the last week of class, some students had dropped the class (but were still on the roster) and some students were not present on the day the quiz was given. All students who were present on quiz day were given the assessment quiz.

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 attending virtual classes during Winter 2021 and all virtual sections were included in the assessment.

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

A common, cumulative, 15-question, multiple-choice assessment quiz was used by all instructors (see attachment). The quiz contained questions from topics from the beginning to the end of the semester, and an answer key was used for grading. Student scores were determined on a percentage basis.

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> |
| 76.1% of students (54/71) scored 73% or higher on the assessment quiz (see the data included in Sheet 1 of the attached Excel spreadsheet). |

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

| |
|---|
| Assessment quiz performance indicates that students showed adequate understanding of content from topics throughout the semester. |
|---|

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.

| |
|--------------------------------|
| No weaknesses were identified. |
|--------------------------------|

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 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 75% or higher
 - Who will score and analyze the data: Departmental 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 |
|------------------------|------------------------|
| 85 | 49 |

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 instructors assigned all 10 labs, so some labs had fewer total participants in the assessment (the least number of participants was 49) and some labs had as many as 82 participants. See Sheet 2 of the attached Excel spreadsheet to see the number of students who participated in each lab.

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 attended virtually for Winter 2021 and all students were provided video-recorded labs.

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

Some instructors required lab reports to assess the student understanding of the content of the lab videos, and some instructors used lab quizzes and/or lab reports for assessment purposes. All student scores were determined on a percentage basis.

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 10 labs included in the lab assessment process over the course of the semester, only one lab fell short of the goal of 75% of students scoring 73% or higher. 9 out of the 10 labs met the goal of 75% of students scoring 73% or higher. See Sheet 2 of the attached Excel spreadsheet to see student scored for each lab.

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

The "e over m" lab was the only lab activity out of the 10 labs where 75% of the students did not achieve 73.0% or better. All other labs indicate that the students have adequate understanding of the lab material.

- 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.

Since the assessment was done during a "virtual" semester, the students were not actually able to participate in "hands-on" lab activities, which is the more ideal way to conduct labs. The outcomes were adequate for the circumstances, though improvement is expected when hands-on lab activities are once again available.

Efforts toward standardizing the labs that all instructors use during the semester are an ongoing process toward continuous improvement for this learning outcome.

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.

No changes were implemented as a result of the previous assessment.

- 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 course is meeting the needs of the students. There was nothing particularly surprising about the results of the assessment.

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

The information will be shared with Department faculty during faculty meetings in Fall 2021.

- Intended Change(s)

| Intended Change | Description of the change | Rationale | Implementation Date |
|-----------------|--|--|---------------------|
| Objectives | For the cumulative assessment quiz, the standard of success will be changed from "75% of students should achieve a score of 2.5 or better out of | The assessment quiz is a multiple-choice quiz with only one correct answer so a 0-4 point rubric is not appropriate for grading such a quiz. | 2021 |

| | | | |
|--------------------|--|---|------|
| | 4 per question" with students chosen randomly from the population to "75% of students should achieve a percentage score of 73% or better" with all students being tested instead of a random sample of students. | Also, for a class like PHY 222 where there are not many sections and therefore typically fewer than 100 students enrolled each semester, there is no reason not to assess ALL students. | |
| Course Assignments | Efforts will continue to develop a standardized list of labs that all instructors will use throughout the semester. | Students from all sections should experience the same number and type of lab activities. | 2021 |

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

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|----|
| 6. |
|----|

III. Attached Files

[Cumulative Assessment Quiz](#)

[Answer Key to Cumulative Assessment Quiz](#)

[Excel Spreadsheet - Assessment Data](#)

Faculty/Preparer: Danette Bull **Date:** 08/16/2021

Department Chair: Suzanne Albach **Date:** 08/16/2021

Dean: Victor Vega **Date:** 08/18/2021

Assessment Committee Chair: Shawn Deron **Date:** 10/26/2021

Course Assessment Report
Washtenaw Community College

| Discipline | Course Number | Title |
|---------------------------------------|-------------------|--|
| Physics | 222 | PHY 222 07/03/2018- Analytical Physics II |
| Division | Department | Faculty Preparer |
| Math, Science and Engineering Tech | Physical Sciences | Amir Fayaz |
| Date of Last Filed Assessment Report | | |

I. Assessment Results per Student Learning Outcome

Outcome 1: Apply the appropriate physical principles to solve problems pertaining to electricity, magnetism, light and modern physics.

- 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 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) |
|-----------------------------|-------------------------------|------------------------------|
| 2017 | | |

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

| # of students enrolled | # of students assessed |
|------------------------|------------------------|
| 51 | 40 |

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 enrolled students were assessed due to absence. The total number of students present was 40 and all 40 were 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.

All students present in both sections were assessed.

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

A departmental exam was given consisting of 10 problems dealing with the topics of electricity, magnetism, light and modern physics. The problems were scored on a scale of 0 – 4 which is the rubric for the department. The rubric is as follows:

0 - The student does not attempt the problem.

1 - The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort.

2 - The student partially achieves the goal of the problem. A limited grasp of the main physics principles is demonstrated. Some of the work may be incomplete, misdirected or unclear.

3 - The student substantially achieves the physics goal. The main thrust of the physics behind it is understood, but there may be some minor error of content or errors in computation.

4 - The student fully achieves the mathematical goal. All work is complete and correct.

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

More than 75% of all the students assessed achieved the desired learning outcome stated in the master syllabus. The percentage of students that achieved the desired learning outcome for each section were as follows:

Electricity: 90%
 Magnetism: 85%
 Light: 87%
 Modern Physics: 85%

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

The students demonstrated a very good grasp of the concept of the subjects in general with the strongest performance in the field of Electricity.

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.

No weaknesses were identified.

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 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 75% or higher
 - Who will score and analyze the data: Departmental 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) |
|-----------------------------|-------------------------------|------------------------------|
| 2017 | | |

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

| # of students enrolled | # of students assessed |
|------------------------|------------------------|
| 51 | 40 |

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.

Absence. The total number of students present was 40 and all 40 were 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.

All students present in both sections were included in the assessment. A random sample of 25 lab reports out of 40 were chosen to be assessed.

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

Lab reports were evaluated and reviewed to confirm they included: Introduction, Collecting Data, Calculations and Conclusions. Students were given a score ranging from 0 - 10 on each report. Students completed 10 lab reports.

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

Students scored extremely well on this outcome. The average score on lab reports was 87%. Furthermore, 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.

Overall, the students' work indicated they have achieved the objectives with a very high performance for this learning outcome.

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.

No weaknesses were identified.

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?

In general, this assessment shows the course is helping students to learn the fundamental principles involving Analytical Physics II. I believe this course definitely meets the needs of the students.

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

This information will be shared with the faculty at the next departmental meeting.

3. Intended Change(s)

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

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

5.

III. Attached Files

[Assessment data](#)

[Assessment Lab data](#)

Faculty/Preparer: Amir Fayaz **Date:** 07/10/2018

Department Chair: Kathleen Butcher **Date:** 07/12/2018

Dean: Kristin Good **Date:** 07/13/2018

Assessment Committee Chair: Shawn Deron **Date:** 08/27/2018

COURSE ASSESSMENT REPORT

I. Background Information

1. Course assessed:

Course Discipline Code and Number: PHY 222

Course Title: Analytical Physics II

Division/Department Codes: MSH

2. Semester assessment was conducted (check one):

Fall 20__

X Winter 2011

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?

X Yes

No

If yes, have the tools been altered since its last administration? If so, briefly describe changes made.

No

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

Total number of students in two sections of the class was 48. 10 students were assessed > 20% of the class.

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

Random number generator program was used by two full time faculty to select the students' tests.

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.)*

Apply the appropriate physical principles to solve problems pertaining to electricity, magnetism, light and modern physics.

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 75% of the students assessed would achieve a score of 2.5 or higher.

COURSE ASSESSMENT REPORT

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 spreadsheet.

There were 10 problems which included the topics of electricity, magnetism, light and modern physics. The problems were scored on a scale of 0-4 which follows the rubric for the department/course. The standard of success was set that 75% of the students assessed would achieve a score of 2.5 or higher. For each outcome listed below, the students' scores exceeded the 75% goal with the exception of Magnetism where the % was only 70.

The overall % success rate for all 4 topics combined was 88%.

| Topic | Mean | % of students |
|----------------|------|---------------|
| Electricity | 3.3 | 9/10 = 90% |
| Magnetism | 2.9 | 7/10 = 70% |
| Light | 3.5 | 9/10 = 90% |
| Modern Physics | 3.5 | 10/10 = 100% |

5. 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: Clearly almost all students appear to have met or exceeded the learning outcomes for this course.

Weaknesses: With the limited sampling of students it is hard to say conclusively that there needs to be any sort of change in terms of the topic of magnetism. 70% is still strong though not at the stated standard for success of 75%. It is probably worth considering giving a bit more time to this topic in the future.

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. *(If students met all expectations, describe your plan for continuous improvement.)*

With an overall success rate of 88% I would just continue to teach as I have in the past, though, again I am likely to try to spend a little more time on the topic of magnetism.

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:

COURSE ASSESSMENT REPORT

- f. Course materials (check all that apply)
 - Textbook
 - Handouts
 - Other:

- g. Instructional methods
Change/rationale:

- h. x Individual lessons & activities
Change/rationale: more time/more problems for the magnetism unit.

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: Amir Fayaz
Faculty/Preparer

Signature Amir U. Fayaz Date: 02/07/12

Print: Kathleen Butcher
Department Chair

Signature Kathleen Butcher Date: 11/23/11

Print: Martha A. Showalter
Dean/Administrator

Signature M. Showalter Date: 12/2/11

COURSE ASSESSMENT REPORT

I. Background Information

1. Course assessed:
 Course Discipline Code and Number: PHY222
 Course Title: Analytical Physics II
 Division/Department Codes: MNB

2. Semester assessment was conducted (check one):
 Fall 20__
 Winter 2008
 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.
 Total number of students in class was 23 students, and 5 students were assessed. Greater than 20% of the class.

6. Describe how students were selected for the assessment.
 Blind drawing by a part-time departmental faculty member.

II. Results

1. Briefly describe the changes that were implemented in the course as a result of the previous assessment.
 This is the first assessment of the course, so we have not made changes before.

2. State each outcome (verbatim) from the master syllabus for the course that was assessed.
 Apply the appropriate physical principles to solve problems pertaining to electricity, magnetism, light and modern physics.

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.*
 See attached spreadsheet.
 There were four problems selected from the final exam for each student. The problems included the topics of electricity, magnetism, light and modern physics.
 The problems were scored on a scale of 0-4; this is the rubric for the department. The following are the average scores for each section of the test.
 Electricity – 3.2
 Magnetism – 3
 Light – 3.4
 Modern Physics – 4

COURSE ASSESSMENT REPORT

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.*

For each outcome, 75% of the students were expected to achieve a score of 3 or better per question. The results are as follows:

Electricity: 100% of the students scored 3 or better

Magnetism: 80% of the students scored 3 or better

Light: 100% of the students scored 3 or better

Modern Physics: 100% of the students scored 3 or better

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

Strengths: The students demonstrated their capability to apply the principles of physics to solve the problems.

Weaknesses: None

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.

N/A

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. N/A

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:

3. What is the timeline for implementing these actions? N/A

IV. Future plans

1. Describe the extent to which the assessment tools used were effective in measuring student achievement of learning outcomes for this course.

COURSE ASSESSMENT REPORT

To a high extent, the assessment tool used was effective. The tool gave the department a better understanding of the students' achievement and the areas with which they lacked.

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

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

All X Selected _____

If "All", provide the report date for the next full review: The next coarse review is scheduled for winter of 2010, _____.

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

Submitted by:

Name: Amir N. Fayaz Amir N. Fayaz Date: 9/19/2008
Print/Signature

Department Chair: Kathy Butcher Kathleen Butcher Date: 9/22/08
Print/Signature

Dean: Martha Showalter M. Showalter Date: SEP 24 2008
Print/Signature