

**Course Assessment Report  
Washtenaw Community College**

Discipline	Course Number	Title
Heating, Ventilation, Air Conditioning and Refrigeration	202	HVA 202 04/26/2021-Air System Layout and Design
College	Division	Department
Advanced Technologies and Public Service Careers	Advanced Technologies and Public Service Careers	Heating, Ventilation and A/C
Faculty Preparer		Brian Martindale
Date of Last Filed Assessment Report		09/21/2015

**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  
It was last assessed in 2017 by Mike Kontry.

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

It was found that the students are retaining the information and meeting the objectives and outcomes for the course.

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

Since the 2020 Fall Semester the class changed from Face-to-Face to Mixed Mode with Lab due to the Covid 19 pandemic.

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

Outcome 1: Identify duct systems and industry design standards.

- Assessment Plan
  - Assessment Tool: A departmental final exam will be used to assess understanding of key concepts
  - Assessment Date: Fall 2018
  - Course section(s)/other population: All sections

- Number students to be assessed: All students
- How the assessment will be scored: Answer key
- Standard of success to be used for this assessment: A minimum of 70% of the students should achieve an overall average of 70% 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)
	2019, 2018, 2017, 2020	

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

# of students enrolled	# of students assessed
51	46

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.

All of the students who completed the exam 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.

The HVA 202 class runs face-to-face every Winter semester. This assessment covers four years of classes from 2017 to 2020. A total of 46 students were assessed. In Winter 2020 we had to shift from face-to-face to virtual due to Covid-19.

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

There were six questions used for each outcome. These questions came from the final exam.

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 scored an average of 87% on this outcome. Based on the standard of success, which states that 70% of the students will score an overall average of 70% or higher, the students exceeded this standard.

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

Based on an item analysis of the questions, between 38 and 43 of the 46 students correctly answered each of the 6 questions. Overall, individual student's scores ranged from 82.6% to 93.5%. Based on this information, students were able to correctly identify duct systems and recognize design standards.

- 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, students correctly answered between 82.6% and 93.5% of the questions. Based on this information, no areas of weakness were identified for this outcome.

#### Outcome 2: Recognize Indoor Air Quality issues and standards.

- Assessment Plan
  - Assessment Tool: A departmental final exam will be used to assess understanding of key concepts
  - Assessment Date: Fall 2018
  - Course section(s)/other population: All sections
  - Number students to be assessed: All students
  - How the assessment will be scored: Answer key
  - Standard of success to be used for this assessment: A minimum of 70% of the students should achieve an overall average of 70% or higher.
  - Who will score and analyze the data: Departmental faculty

- 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)
	2020, 2019, 2018, 2017	

- Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
51	46

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.

All the students who completed the exam 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.

The HVA 202 course was taught in a Face-to-Face format. However, in Winter of 2020 the class was converted to virtual format due to Covid-19.

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

A different set of six questions was used from the final exam for this outcome.

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 scored an average of 92% on this outcome. Based on the standard of success, which states that 70% of the students will score an overall average of 70% or higher, the students exceeded this standard.

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

Based on the results of the assessment, student scores ranged from 39 - 44 correct answers out of a total of 46. Overall, students' scores ranged from 84.7% to 95.6%. Based on this information, students were able to correctly identify duct systems and recognize design standards.

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.

Based on the results of the assessment, student scores ranged from 39 - 44 correct answers out of a total of 46. Overall, students' scores ranged from 84.7% to 95.6%. Based on this information, no areas of weakness were identified for this outcome.

Outcome 3: Diagnose airflow problems related to indoor environment and human comfort.

- Assessment Plan
  - Assessment Tool: A departmental final exam will be used to assess understanding of key concepts
  - Assessment Date: Fall 2018
  - Course section(s)/other population: all sections
  - Number students to be assessed: All students
  - How the assessment will be scored: Answer key
  - Standard of success to be used for this assessment: A minimum of 70% of the students should achieve an overall average of 70% 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)
	2020, 2019, 2018, 2017	

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

# of students enrolled	# of students assessed
51	46

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.

All the students who completed the exam 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.

The HVA 202 course was taught in a Face-to-Face format. However, in Winter of 2020 the class was converted to virtual format due to Covid-19.

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

A different set of six questions was used from the final exam for this outcome.

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 scored an average of 91% on this outcome. Based on the standard of success, which states that 70% of the students will score an overall average of 70% or higher, the students exceeded this standard.

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

Based on the results of the assessment, student scores ranged from 32 - 45 correct answers out of a total of 46. Overall, students' scores ranged from 69.5% to 97.8%. Based on this information, students were able to correctly identify duct systems and recognize design standards.

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.

Students had the most difficulty with question #37, which asked "A plume of cold air discharged from a ceiling or high side wall outlet that falls into the occupied zone before being mixed with room air is called". The correct answer was B - "drop". Many students went with a distractor answer of "stratification" which was not correct.

This question will be evaluated and the definitions of "drop" and "stratification" will be discussed further in the class.

### **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.

There were no intended changes on the 2016 assessment report.

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?

With the exception of one test question, students performed very well on the assessment test questions. They seemed to understand the important concepts in air system layouts and design.

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

This information will be shared at a departmental meeting.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Assessment Tool	Question #37 will be reviewed and, if it is a good question, the content will be discussed further in the class.	The goal will be to improve student recognition of HVACR vocabulary.	2022
Other: standard of success	Update the standard of success or the number of questions used for assessment.	The current number of questions used for assessment does not allow students to score the percentage listed in the standard of success (70%).	2022

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

6.

### III. Attached Files

[Data Sheet calculations](#)

**Faculty/Preparer:** Brian Martindale **Date:** 04/28/2021  
**Department Chair:** Brian Martindale **Date:** 04/29/2021  
**Dean:** Jimmie Baber **Date:** 06/16/2021  
**Assessment Committee Chair:** Shawn Deron **Date:** 09/23/2021

**Course Assessment Report  
Washtenaw Community College**

Discipline	Course Number	Title
Heating, Ventilation, Air Conditioning and Refrigeration	202	HVA 202 01/26/2017-Air System Layout and Design
Division	Department	Faculty Preparer
Advanced Technologies and Public Service Careers	Heating, Ventilation and A/C	Michael Kontry
Date of Last Filed Assessment Report		

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

Outcome 1: Identify duct systems and industry design standards.

- Assessment Plan
  - Assessment Tool: Departmental final exam
  - Assessment Date: Winter 2008
  - Course section(s)/other population: all
  - Number students to be assessed: all
  - 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, 2016	

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

# of students enrolled	# of students assessed
36	35

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.

1 student in Winter 2015 did not take the final exam

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 selected

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

Multiple choice questions from the final exam using an answer key.

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 96.6% on this outcome.

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

Students exhibited a very good knowledge of the different duct systems and the related industry design standards.

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.

Recommend continuing present course of instruction on this area.

#### Outcome 2: Recognize Indoor Air Quality issues and standards.

- Assessment Plan
  - Assessment Tool: Departmental final exam
  - Assessment Date: Winter 2008
  - Course section(s)/other population: all
  - Number students to be assessed: all
  - 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)
	2016, 2015	

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

# of students enrolled	# of students assessed
36	35

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.

1 student in Winter 2015 did not take the final exam,.

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 selected

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

Multiple choice questions from the final exam using an answer key.

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 95.4% on this outcome.

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

Students exhibited a strong knowledge of indoor air quality issues and related standards.

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.

Recommend continuing present instruction on this area.

Outcome 3: Diagnose air flow problems related to indoor environment and human comfort.

- Assessment Plan
  - Assessment Tool: Departmental final exam
  - Assessment Date: Winter 2008
  - Course section(s)/other population: all
  - Number students to be assessed: all
  - 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)
	2016, 2015	

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

# of students enrolled	# of students assessed
36	35

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.

1 student in Winter 2015 did not take the final exam.

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 selected

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

Multiple choice questions from the final exam using an answer key.

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 82.3% on this outcome.

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

Students exhibited a good knowledge of ductwork pressures and air flow principles.

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.

More time could be spent on calculations for correct ductwork sizing and the use of Manual D for sizing residential duct systems.

## 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 understanding of the concepts explained in this course seem above average. The course appears to be meeting students' needs in the areas of importance for residential ductwork design and its related calculations and diagnosing of air flow problems.

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

All instructors involved in the HVA 202 course will be verbally informed of this information in a 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?

No

### III. Attached Files

[HVA 202 Outcomes](#)

**Faculty/Preparer:** Michael Kontry **Date:** 03/21/2017  
**Department Chair:** Robert Carter **Date:** 03/30/2017  
**Dean:** Brandon Tucker **Date:** 03/31/2017  
**Assessment Committee Chair:** Ruth Walsh **Date:** 04/25/2017

**Course Assessment Report**  
**Washtenaw Community College**

Discipline	Course Number	Title
Heating, Ventilation, Air Conditioning and Refrigeration	202	HVA 202 07/02/2015-Air System Layout and Design
Division	Department	Faculty Preparer
Advanced Technologies and Public Service Careers	Heating, Ventilation and A/C	Michael Kontry
Date of Last Filed Assessment Report		

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

Outcome 1: Identify duct systems and industry design standards.

- Assessment Plan
  - Assessment Tool: Departmental final exam
  - Assessment Date: Winter 2008
  - Course section(s)/other population: all
  - Number students to be assessed: all
  - 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, 2014, 2013	

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

# of students enrolled	# of students assessed
51	47

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.

47 students completed the final exam.

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 selected.

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

Multiple choice questions from final exam related to the outcome using an answer key.

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

87.2% of the students scored correctly on this outcome. The standard of success was 70% of the students will score 70% or higher.

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

Students appeared to have a good understanding of the different types of duct systems in the field.

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.

An increase in the students' understanding of some of the duct related pressure principles would be desirable.

## Outcome 2: Recognize Indoor Air Quality issues and standards.

- Assessment Plan
  - Assessment Tool: Departmental final exam
  - Assessment Date: Winter 2008
  - Course section(s)/other population: all
  - Number students to be assessed: all

- 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, 2014, 2013	

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

# of students enrolled	# of students assessed
51	47

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.

47 students completed final exam.

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 selected.

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

Multiple choice questions from final exam related to the outcome using an answer key.

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  
 96.5% of the students scored correctly on this outcome. The standard of success was 70% of the students will score 70% or higher.

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

Students have a very good grasp on Indoor Air Quality issues.

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.

Continue to stress Indoor Air Quality issues as in the past.

Outcome 3: Diagnose air flow problems related to indoor environment and human comfort.

- Assessment Plan
  - Assessment Tool: Departmental final exam
  - Assessment Date: Winter 2008
  - Course section(s)/other population: all
  - Number students to be assessed: all
  - 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, 2014, 2013	

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

# of students enrolled	# of students assessed
51	47

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.

47 students completed the final exam.

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 selected.

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

Multiple choice questions from final exam related to the outcome using an answer key.

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

89.7% of the students scored correctly on this outcome. The standard of success was 70% of the students will score 70% or higher.

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

Students seem to have a very good understanding of the methods to calculate duct system flow.

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.

More instruction on the ability of insulation to enhance human comfort would be desirable.

## 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?

Students are learning the importance of indoor air quality and how their understanding of airflow related work can impact that quality. We could have a little more time in this course spent stressing the importance of insulation on ductwork.

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

Members of the department, especially the instructor for this course, will be informed by direct conversation before the start of the next HVA 202 class.

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.
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### III. Attached Files

[HVA 202 assessment document](#)

**Faculty/Preparer:** Michael Kontry **Date:** 07/09/2015

**Department Chair:** Michael Kontry **Date:** 07/14/2015

**Dean:** Brandon Tucker **Date:** 08/10/2015

**Assessment Committee Chair:** Michelle Garey **Date:** 09/21/2015

**COURSE ASSESSMENT REPORT**

**I. Background Information**

1. Course assessed:  
 Course Discipline Code and Number: **HVA 202**  
 Course Title: **Air System Layout and Design**  
 Division/Department Codes: **VCT/HVA**

Semester assessment was conducted (check one):

- Fall **2008**  
 Winter 20\_\_  
 Spring/Summer 20\_\_

2. 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):

3. 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.

4. Indicate the number of students assessed/total number of students enrolled in the course.

**All students in all sections completing the final exam, 13 of 13 students**

5. Describe how students were selected for the assessment.

**All students taking the final test**

**II. Results**

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

**N/A**

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

- 1. Identify duct systems, and industry design standards.**
- 2. Recognize Indoor Air Quality issues and standards.**
- 3. Diagnose air flow problems related to indoor environment and human comfort.**

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.*

**Students met the standard of success in all of the above listed outcomes,**

**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.*

**Standard of success: 70% of students should achieve an overall average on the assessment questions of 70% or higher.**

Percentage of comprehension for objectives 1-3		
1	2	3
79%	92%	88%

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

**Strengths: Students displayed a strong grasp of indoor air quality issues and standards.**

**Weaknesses: Students displayed a weakness on the effect of friction on an air delivery system.**

**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.

**Include a hand-out on friction loss in the first day handouts.**

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: **Friction loss handout**

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? **Fall 2009**

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**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 use of a standardized departmental final exam made assessing students easy and effective.**

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

**Assessment tools worked effectively**

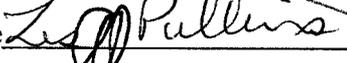
- 3. Which outcomes from the master syllabus have been addressed in this report?

All  Selected

If "All", provide the report date for the next full review: Fall 2011.

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

**Submitted by:**

Print: <u>DANIEL LAWRENCE</u> Faculty/Preparer	Signature: <u></u>	Date: <u>4-15-09</u>
Print: <u>Les Pullins</u> Department Chair	Signature: <u></u>	Date: <u>4-16-09</u>
Print: <u>Bruce Greene</u> Dean/Administrator	Signature: <u></u>	Date: <u>4/20/09</u>

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Percentage of comprehension for objectives 1-3		
1	2	3
79%	92%	88%

