

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

Discipline	Course Number	Title
Heating, Ventilation, Air Conditioning and Refrigeration	103	HVA 103 07/14/2015- Heating, Ventilation, and Air Conditioning II
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: Solve electrical problems by applying the fundamental relationships between voltage, current, resistance and power.

- Assessment Plan
  - Assessment Tool: A departmental final exam will be used to assess understanding of key concepts
  - Assessment Date: Winter 2007
  - 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)
2013, 2012	2014, 2012	2012

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

# of students enrolled	# of students assessed
107	45

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.

45 students completed final exam. Exams from some instructors were not available for assessment. All other students were included in the assessment.

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 the 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

77.8% 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.

Using the basic Ohm's Law formula proved to be a strength in this 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.

More related math problems would be helpful for the students to achieve better scores.

Outcome 2: Identify series, parallel and series-parallel circuits and troubleshoot them.

- Assessment Plan

- Assessment Tool: A departmental final exam will be used to assess understanding of key concepts
- Assessment Date: Winter
- 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)
2013, 2012	2014, 2012	2012

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

# of students enrolled	# of students assessed
107	45

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.

45 students completed the final exam. Exams from some instructors were not available for assessment. All other students were included in the assessment.

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: <u>Yes</u>
80% 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.

Identifying series, parallel, and series parallel seemed to be a strength for these students.
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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 needs to be spent on recognizing the relationship between current, voltage and power in electrical circuits.
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Outcome 3: Identify the operating principles of and trouble shoot electrical components in HVAC systems.

- Assessment Plan
  - Assessment Tool: A departmental final exam will be used to assess understanding of key concepts
  - Assessment Date: Winter
  - 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)
2013, 2012	2014, 2012	2012

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

# of students enrolled	# of students assessed
107	45

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.

45 students completed the final exam. Exams from some instructors were not available for assessment. All other students were included in the assessment.

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

88.1% 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.

Troubleshooting an electrical circuit with a voltmeter proved to be a strength in this 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.

Students as a whole did very well on this outcome. We will continue to stress troubleshooting as a high priority in this class.

Outcome 4: Apply alternating current principles to the installation and testing of HVAC systems.

- Assessment Plan

- Assessment Tool: A departmental final exam will be used to assess understanding of key concepts
- Assessment Date: Winter
- 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)
2013, 2012	2014, 2012	2012

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

# of students enrolled	# of students assessed
107	45

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.

45 students completed the final exam. Exams from some instructors were not available for assessment. All other students were included in the assessment.

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: <u>No</u>
67.4% 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 good understanding of the main power circuit box.
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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 needs to be allotted to the electrical calculation and wiring of circuits for HVAC applications.
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Outcome 5: Identify, test and troubleshoot motors and motor controls.

- Assessment Plan
  - Assessment Tool: A departmental final exam will be used to assess understanding of key concepts
  - Assessment Date: Winter
  - 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)
2013, 2012	2014, 2012	2012

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

# of students enrolled	# of students assessed
107	45

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.

45 students completed the final exam. Exams from some instructors were not available for assessment. All other students were included in the assessment.

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 the 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: No

65.6% 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 showed a very good understanding of motors that are used in the HVAC industry.

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.

Motor controls need to have more time set aside for better student understanding.

Outcome 6: Interpret electrical diagrams and use them to troubleshoot HVAC systems.

- Assessment Plan

- Assessment Tool: A departmental final exam will be used to assess proficiency in applying the concepts and in performing hands-on tasks
- Assessment Date: Winter
- 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)
2013, 2012	2014, 2012	2012

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

# of students enrolled	# of students assessed
107	45

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.

45 students completed the final exam. Exams from some instructors were not available for assessment. All other students were included in the assessment.

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 the 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  
 79.4% of the students scored correctly on this outcome. The standard of success was 70% of the students will score 70% or higher.

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

Students showed a very good understanding of motor operation and how to diagnose problems with them.

- 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 needs to be spent on the reading of wiring diagrams for use in diagnosing problems.

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

- 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?

Not a surprise, but more time needs to be spent on the basics of electrical operation and troubleshooting since a good part of this trade relies on a clear understanding of electrical principles and how to use them.

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

All instructors of the HVA 103 course will be verbally informed of this need.

- 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?

This course needs to be re-evaluated on the basis of only instructing the students on the necessary components of electrical principles and troubleshooting as they apply to the HVAC field in real-life. Theory of electricity is **nice-to-know** and, in some instances, necessary to understand the application in the field, but, in many

instances, not a **need-to-know** situation in real life. Unrelated theory may be mentioned and explained but not stressed or emphasized in examinations.

### III. Attached Files

[HVA 103 assessment document](#)

**Faculty/Preparer:** Michael Kontry **Date:** 07/21/2015

**Department Chair:** Michael Kontry **Date:** 07/23/2015

**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 103  
 Course Title: HVAC II  
 Division/Department Codes: VCT/WAFD:HVA

2. Semester assessment was conducted (check one):

- Fall 2008
- 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, not for this course.

— If yes, have the tools been altered since its last administration? If so, briefly describe changes made.  
 A hands-on troubleshooting section was added to the final exam.

5. Indicate the number of students assessed/total number of students enrolled in the course.  
 72 assessed, 72 enrolled

6. Describe how students were selected for the assessment.  
 All students

**II. Results**

1. Briefly describe the changes that were implemented in the course as a result of the previous assessment.  
 — More time was spent on troubleshooting discussions and exercises.

2. State each outcome (verbatim) from the master syllabus for the course that was assessed.

1. Solve electrical problems by applying the fundamental relationships between voltage, current, resistance and power.
2. Recognize series, parallel and series-parallel circuits and troubleshoot them.
3. Identify the operating principles of, and troubleshoot electrical components in HVAC systems.
4. Apply alternating current principles to the installation and testing of HVAC systems.
5. Identify, test and troubleshoot motors and motor controls
6. Interpret electrical diagrams and use them to troubleshoot HVAC systems

**COURSE ASSESSMENT REPORT**

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.*

All students in all sections were given the departmental final exam which consisted of multiple choice questions, drawings and short answer questions. The questions on the exam were grouped according to the related Course Outcome. The exams were graded and the percent of students answering the questions in each outcome group was calculated. These percentages, averaged over five semesters are shown below. The results for the previous assessment report are shown for comparison.

**HVA 103 Final Exam Results: F2006 - F2008**

Outcome Number	Course Outcomes	F2006-F2008		F2004-W2006
		% Wrong - Avg. all sections	% Correct - Avg. All Semesters	% Correct - Avg. All Semesters
1	Solve electrical problems by applying the fundamental relationships between voltage, current, resistance and power.	12	88	88
2	Recognize series, parallel and series-parallel circuits and troubleshoot them.	13	87	86
3	Identify the operating principles of, and troubleshoot electrical components in HVAC systems.	18	82	84
4	Apply alternating current principles to the installation and testing of HVAC systems.	25	75	74
5	Identify, test and troubleshoot motors and motor controls	23	77	75
6	Interpret electrical diagrams and use them to troubleshoot HVAC systems	21	79	69
Average of all Objectives		19	81	79

Details are on an attached sheet. On this sheet, any significant between-semester changes are highlighted in green (20 % improvement) or yellow (20 % loss). Also, the average score over all semesters is computed for each question, and any average greater than 30% is highlighted in red.

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.*

Our standard of success was that 70% of the students would answer the final exam questions relating to each outcome correctly. Questions were all right or wrong so no "rubric" was used. This standard was met for all 6 outcomes.

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

Students did well on the first three outcomes, which deal with electricity basics, scoring 88, 87 and 82% respectively. This indicates that students are building a strong foundation for further learning.

The last three outcomes involve more difficult concepts, and integrate and build on the other outcomes, so we were not surprised the scores were a little lower. We were encouraged however that there was an improvement in the results of Outcome 6, from 69% to 79% between

**COURSE ASSESSMENT REPORT**

this assessment report and the one done after the W2006 semester. Students meeting Outcome 6 demonstrated that they understood the other five outcomes and could integrate this information to solve a troubleshooting problem.

Looking at all the red ink on the attached spreadsheet (% Wrong – Avg. all sections column), gives us a list of specific areas in which the students were weak. Of these, we are most concerned about the questions involving troubleshooting (Outcome 6) since the main goal of the course is to build a foundation to enable students to troubleshoot HVAC systems. As mentioned above, these questions are more difficult because they build on and integrate other information from the course. In the last assessment report, we considered that one possible explanation for the lower scores in this area was the form of the test. Since troubleshooting is a hands-on as well as mental activity, we were concerned that we may not be assessing troubleshooting ability accurately with a paper only test. The results in this assessment report reflect the addition of five new hands-on troubleshooting problems to the final exam (Questions 76-80, labeled ACCS fault 1 – ACCS fault 5). We were encouraged to see that these results were generally good, and that in fact the addition of the hands-on questions raised the overall score for Outcome 6, supporting our theory that the paper only test was a poor indication of student's ability.

**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.

Students continue to have difficulty with the more theoretical concepts and with thinking through a problem rather than working their way through it. Since the HVAC program attracts students who like to "work with their hands" instead of think abstractly, this is no surprise. However, it is still useful and time-saving when troubleshooting to be able to think a problem through, so we will continue to emphasize this skill as part of the hands-on troubleshooting exercises.

2. Identify intended changes that will be instituted based on results of this assessment activity (check all that apply). Please describe changes and give rationale for change.

- a.  Outcomes/Assessments on the Master Syllabus  
Change/rationale:

- b.  Objectives/Evaluation on the Master Syllabus  
Change/rationale:

- c.  Course pre-requisites on the Master Syllabus  
Change/rationale:

- d.  1<sup>st</sup> Day Handouts  
Change/rationale:

- e.  Course assignments  
Change/rationale:

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

- g.  Instructional methods  
Change/rationale:

- h.  Individual lessons & activities  
Change/rationale: Spend more time in discussions and exercises on thinking through a problem when beginning to troubleshoot.

**COURSE ASSESSMENT REPORT**

3. What is the timeline for implementing these actions? Start with F2009 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 assessment tool was basically effective in confirming our individual impressions of student success. The addition of hands-on exercises helped improve the assessment of troubleshooting skills.

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: Fall 2012

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

**Submitted by:**

Name: Dale Petty Dale Petty Date: 5/5/2009  
Print/Signature

Name: Les Pullins Les Pullins Date: 5/5/2009  
Print/Signature

Department Chair: Les Pullins Les Pullins Date: 5/5/2009  
Print/Signature

Dean: [Signature] [Signature] Date: 5/12/09  
Print/Signature

*logged 5/12/09 sj*

**COURSE ASSESSMENT REPORT**

**I. Background Information**

1. Course assessed:  
 Course Discipline Code and Number: HVA 103  
 Course Title: HVAC II  
 Division/Department Codes: VCT/WAFD:HVA
  
2. Semester assessment was conducted (check one):  
 Fall 2004, 2005  
 Winter 2004, 2005, 2006  
 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, not for this course.

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.  
 86 assessed, 86 enrolled
  
6. Describe how students were selected for the assessment.  
 All students

**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 this course.
  
2. State each outcome (verbatim) from the master syllabus for the course that was assessed.
  1. Solve electrical problems by applying the fundamental relationships between voltage, current, resistance and power.
  2. Recognize series, parallel and series-parallel circuits and troubleshoot them.
  3. Identify the operating principles of, and troubleshoot electrical components in HVAC systems.
  4. Apply alternating current principles to the installation and testing of HVAC systems.
  5. Identify, test and troubleshoot motors and motor controls
  6. Interpret electrical diagrams and use them to troubleshoot HVAC systems

**COURSE ASSESSMENT REPORT**

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.*

All students in all sections were given the departmental final exam which consisted of multiple choice questions, drawings and short answer questions. The questions on the exam were grouped according to the related Course Outcome. The exams were graded and the percent of students answering the questions in each outcome group was calculated. These percentages, averaged over five semesters are shown below.

Outcome Number	Course Outcomes	% Correct - Avg. All Semesters
1	Solve electrical problems by applying the fundamental relationships between voltage, current, resistance and power.	88
2	Recognize series, parallel and series-parallel circuits and troubleshoot them.	85
3	Identify the operating principles of, and troubleshoot electrical components in HVAC systems.	84
4	Apply alternating current principles to the installation and testing of HVAC systems.	73
5	Identify, test and troubleshoot motors and motor controls	75
6	Interpret electrical diagrams and use them to troubleshoot HVAC systems	67
Average of all Objectives		79

Details are on an attached sheet. On this sheet, any significant between-semester changes are highlighted in green (20 % improvement) or yellow (20 % loss). Also, the average score over all semesters is computed for each question, and any average greater than 30% is highlighted in red.

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.*

Our standard of success was that 70% of the students would answer the final exam questions relating to each outcome correctly. Questions were all right or wrong so no "rubric" was used. This standard was met for 5 of the 6 outcomes.

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

**Strengths:** Students did well on the first three outcomes, which deal with electricity basics, scoring 88, 85 and 84% respectively. This indicates that students are building a strong foundation for further learning.

**Weaknesses:** The last three outcomes involve more difficult concepts, and integrate and build on the other outcomes, so we were not surprised the scores were a little lower. Specifically, Outcome 6 - interpreting diagrams and troubleshooting HVAC systems, fell below our 70% standard. Students meeting this outcome demonstrated that they understood the other five outcomes and could integrate this information to solve a troubleshooting problem.

**COURSE ASSESSMENT REPORT**

Looking at all the red ink on the second page of the attached spreadsheet (% Wrong – Avg. all sections column), gives us a list of specific areas in which the students were weak. Of these, we are most concerned about the questions involving troubleshooting since the main goal of the course is to build a foundation to enable students to troubleshoot HVAC systems. As mentioned above, these questions are more difficult because they build on and integrate other information from the course. One possible explanation for the lower scores in this area is the form of the test. Since troubleshooting is a hands-on as well as mental activity, we may not be assessing troubleshooting ability accurately with a paper only test.

**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.

More time will be spent in class on thinking through troubleshooting problems. A hands-on troubleshooting section will be added to the final exam.

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: The Master Syllabus is out of date.

b.  Objectives/Evaluation on the Master Syllabus  
Change/rationale: The Master Syllabus is out of date.

c.  Course pre-requisites on the Master Syllabus  
Change/rationale:

d.  1<sup>st</sup> Day Handouts  
Change/rationale:

e.  Course assignments  
Change/rationale:

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

g.  Instructional methods  
Change/rationale:

h.  Individual lessons & activities  
Change/rationale: Spend more time on troubleshooting discussions and exercises.

3. What is the timeline for implementing these actions? End of W2007 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 assessment tool was basically effective in confirming our individual impressions of student success. However, since it was all on paper, it was somewhat limited in assessing troubleshooting skills.

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

We will include a hands-on test of troubleshooting skills on future final exams.

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: Fall 2009

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

Submitted by:

Name: Les Pullios / L. Pull Date: 11-17-06  
Print/Signature

Name: Dale Petty / D. Petty Date: 11-17-06  
Print/Signature

Department Chair: William H. Fugate Date: 11-22-06  
Print/Signature

Dean: [Signature] Date: 12-6-06  
Print/Signature

COURSE ASSESSMENT REPORT CHECKLIST

Please review to ensure the following items are included in the Course Assessment Report:

- Have you attached a summary of data collected?
- Have you attached the analysis of data collected? – analysis is included in this report
- Have you attached the rubric/scoring guide used for assessment? – questions were all right or wrong
- Did you have adequate and representative sample(s)?

If curricular changes were made:

- Did you connect them to assessment results? - We'll be working on a new Master Syllabus
- Did you identify changes in Part III, item 2?