

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Heating, Ventilation, Air Conditioning and Refrigeration	203	HVA 203 03/21/2017-Refrigeration Systems
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 the types of refrigeration systems and their operation.

- Assessment Plan
 - Assessment Tool: multiple choice test
 - Assessment Date: Fall 2011
 - 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, 2016	2013	

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

# of students enrolled	# of students assessed
33	30

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.

3 students (1 in 2013 winter and 2 in 2013 fall did not complete the class)

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students 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 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 80% 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 the refrigeration types and general operation.

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.

Parallel rack refrigeration systems showed to be a weak spot in this outcome. More time should be spent on the parallel rack system of refrigeration and its operation.

Outcome 2: Identify the components of refrigeration systems and their operation.

- Assessment Plan
 - Assessment Tool: multiple choice test
 - Assessment Date: Fall 2011
 - 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, 2016	2013	

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

# of students enrolled	# of students assessed
33	30

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.

3 students (1 from winter 2013 and 2 from fall 2013) did not complete the course.

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 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: No
 Students scored 63.3% 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 head pressure and fixed orifice components in refrigeration systems.

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.

Oil separators and thermostatic expansion valve components proved to be weak spots in this outcome. More time needs to be devoted to these components for a better understanding of their use and function.

Outcome 3: Develop a working commercial refrigeration system.

- Assessment Plan
 - Assessment Tool: student project
 - Assessment Date: Fall 2011
 - 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, 2016	2013	

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

# of students enrolled	# of students assessed
33	30

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.

3 students (1 from winter 2013 and 2 from fall 2013) did not complete the course.

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.

Lab projects involving assembling, wiring, plumbing, and charging are examples of a small commercial refrigeration box.

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 96.7% on this outcome

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

As "hands on" work is a large part of this trade, students showed an excellent grasp of building the required small, working refrigeration system required for their project.

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.

Neatness for plumbing and wiring lab projects should be emphasized more as aesthetics are an important part of what the general public regards as quality.

Outcome 4: Recognize refrigerant properties for the purpose of retrofitting existing refrigeration systems and charging new refrigeration systems.

- Assessment Plan
 - Assessment Tool: multiple choice test
 - Assessment Date: Fall 2011
 - 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, 2013	2013	

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

# of students enrolled	# of students assessed
33	30

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.

3 students (1 from winter 2013 and 2 from fall 2013) did not complete the course

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 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: No
Students scored 30% 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 the proper charging specifications and procedures for 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.

Retrofitting refrigeration systems proved to be a very weak spot for this outcome. More examples of refrigerant and oil replacement to update old and discontinued refrigerant for existing systems needs to be added to the course in order for students to understand the importance and procedures of updating these systems to work with the present approved refrigerants.

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 seem to be learning the systems, parts and operation of refrigeration systems fairly well. The "hands on" project appears to be a good indication of their mechanical ability to apply the building and charging of the refrigeration boxes. However, more time needs to be spent on some specific special refrigeration parts and their operation, in addition to the proper retrofitting of older systems with new approved refrigerants.

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

All instructors of the HVA 203 class will be verbally informed of this information in a department meeting.

3. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	More handouts and new lecture material need to be developed to enhance knowledge on special components and their operation along with information on proper retrofitting of replacement refrigerants to meet the approved standards. The final	Handouts should give students a visual of these components and procedures and the final exam review will make sure objectives are clearly covered by that tool.	2017

	exam should also be reviewed to make sure language and content properly match the outcomes directly and succinctly.		
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4. Is there anything that you would like to mention that was not already captured?

No

III. Attached Files

[HVA 203 results](#)

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

I. Background Information

1. Course assessed:

Course Discipline Code and Number: **HVA 203**

Course Title: **Refrigeration systems**

Division/Department Codes: **VCT/HVA**

2. Semester assessment was conducted (check one):

Fall 20__

Winter 20__

Spring/Summer **2008**

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): **Rubric used for Student project**

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.

28 out of 28

6. Describe how students were selected for the assessment.

All students completing the course

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 the types of refrigeration systems and their operation.

2. Identify the components of refrigeration systems and their operation.

3. Develop a working commercial refrigeration system.

4. Recognize refrigerant properties for the purpose of retrofitting existing refrigeration systems, and charging new refrigeration systems.

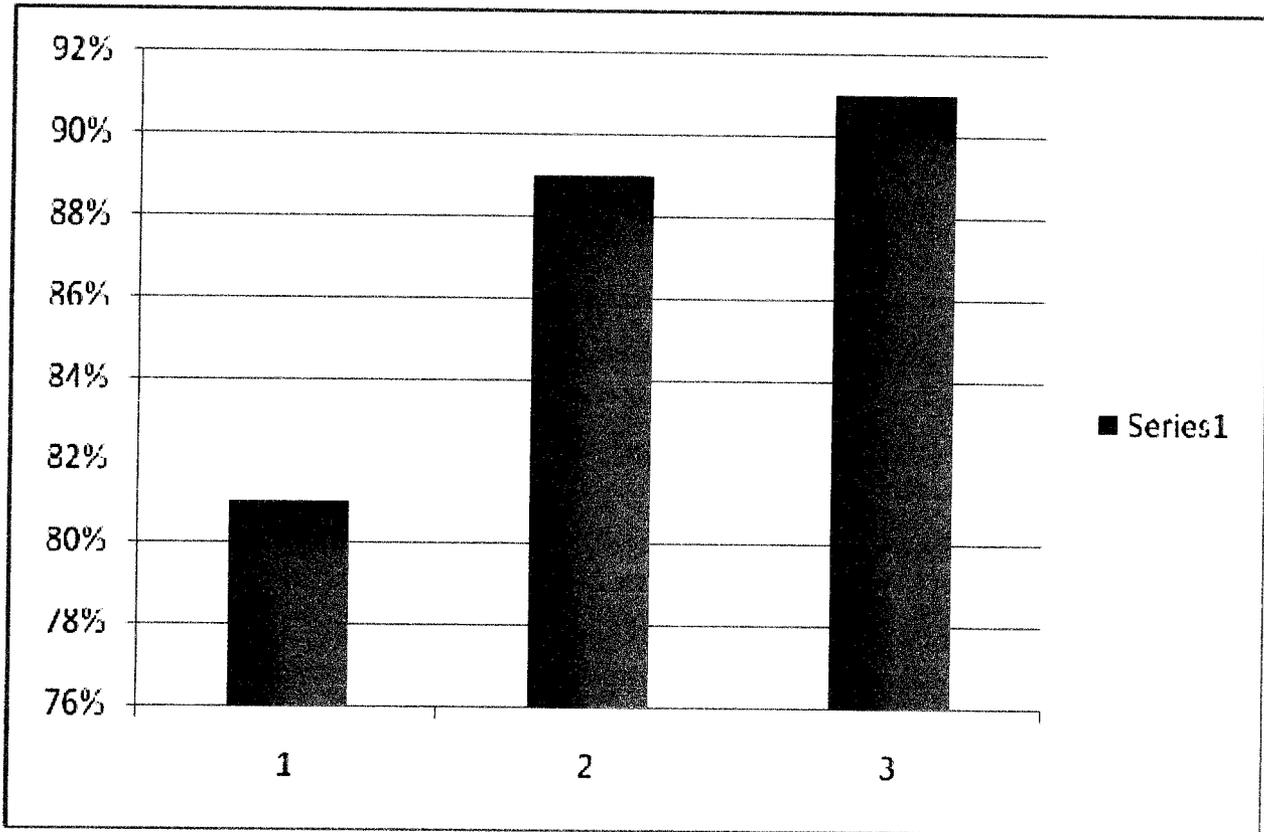
3. Briefly describe assessment results based on data collected during the course assessment, demonstrating the extent to which students are achieving each of the learning outcomes listed above.

Outcomes 1, 2, and 4 were correctly assessed by the application of the final exam.

Outcome 3 was assessed by the rubric for the lab work identified.

COURSE ASSESSMENT REPORT

Outcome #1	Outcome #2	Outcome #3
81%	89%	91%



Outcome #3

75% of students scored at least 2.0 or better on the rubric used for outcome 3.

- 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 outcomes #1, #2, and #4, all students met the minimum requirements of 70%

For outcome #3, 75 % of all students met the minimum requirements of 2.0.

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

Strengths: The classroom work was accomplished well.

Weaknesses: More lab time should be devoted to the projects as students were better at the concepts than with the actual building of the systems by their own hands.

COURSE ASSESSMENT REPORT

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.

During the next class, more time will be spent on the lab portion.

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: None

b. Objectives/Evaluation on the Master Syllabus
Change/rationale: None

c. Course pre-requisites on the Master Syllabus
Change/rationale: None

d. 1st Day Handouts
Change/rationale: None

e. Course assignments
Change/rationale: None

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

g. Instructional methods
Change/rationale: **Spend more time in the lab.**

h. Individual lessons & activities
Change/rationale: **See Above**

3. What is the timeline for implementing these actions? **Spring/ Summer 09**

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 analysis showed the need for more lab time.

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 Selected _____

If "All", provide the report date for the next full review: **Spring/Summer 2011.**

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

COURSE ASSESSMENT REPORT

Submitted by: Les Pullins Signature: Les Pullins Date: 4/20/09
Print: Loren K. Swanson Faculty/Preparer Signature: [Signature] Date: 4/20/09
Print: Les Pullins Department Chair Signature: [Signature] Date: 4/20/09
Print: Bruce Greene Dean/Administrator Signature: [Signature] Date: _____

logged 4/24/09 sjv