MCC Mohave Community College

One Year Periodic Program Review Report

Academic Programs

Heating, Ventilation, Air Conditioning and Refrigeration(HVAC-R)

HVAC and Refrigeration Technology, AAS

HVAC Residential Certificate

HVAC Refrigeration Commercial Certificate

Statement of Collaboration

The program faculty, college staff, students, and community members listed below collaborated in an open and forthright dialogue to prepare this Periodic Program Review. Statements included herein accurately reflect the conclusions and opinions of this group.

Participants in the review:

Department Faculty: Darrell Pohlman, Frank Port
Non-discipline Faculty:
Associate Faculty: Stephen Mermilliod
Student/Alumni:
Academic Support Staff: Rusty Dubois, Jason Gee

Date Submitted to the Dean of Instruction

Authorization

After the document is complete, print just this page and submit it to the Office of Instruction for the Dean's signature.

Signature of Dean _____

Report Sections and Guidelines

The report sections are described below. If you have questions on any section, please contact the [Office of Instruction for assistance](#).

1. **Mission and Goals**

    Identify the certificate(s) and degree(s) under review. Write the mission and goals for each certificate and degree program(s) under review. Briefly describe the relationship of your program to the college's Mission, Vision, Core Values, and College Goals. List the program outcomes for each program under review.

    Certificates and Degrees
    - *HVAC and Refrigeration Technology, AAS—The AAS in HVAC and Refrigeration Technology is designed to provide training in residential heating, ventilation and air conditioning systems, as well as training in commercial HVAC, and commercial and domestic refrigeration systems.*
    - *HVAC Residential Certificate—The Certificate in Residential HVAC prepares the student for a career in residential heating, ventilation, and air conditioning.*
    - *HVAC Refrigeration Commercial Certificate—The Certificate in Commercial Refrigeration prepares the student for a career in HVAC and refrigeration systems with an emphasis on commercial/industrial applications.*

    Mission and Goals

    To develop student skills in order to obtain employment in the Heating, Ventilation, Air Conditioning and Refrigeration industry.

    GOALS

    1.1. Recognize and properly use tools and equipment specific to the HVAC-R industry. (3,5,6)

    1.2. Understand and apply the safe and proper use of various refrigerant types. (3,4,5,6)

    1.3. Service and repair assorted HVAC-R systems found in residential and commercial settings. (3,5,6)

    1.4. Communicate a utilizable knowledge of basic electrical, chemical, and thermal principles to industry customers. (2,3,4,5,6)

The HVAC-R program aligns with the college mission in the areas of being learning-centered, serving all constituencies, and student empowerment. Students are provided extensive opportunities to learn using hands-on techniques that combine with theoretical knowledge. The instructors have a wealth of real-world experience that they share with the students and are willing to listen closely to students as they share their own experiences from the industry. The program is the primary location in the region to receive training in the HVAC-R industry, and it is a commitment of the program to communicate and promote the opportunities available to the community that it offers. The HVAC-R instructors have attended events such as county fairs, college and career expos, HVAC-R trainers and teacher's convention, high school visits, the Welding Thunder event, and provided information for student tours.

The HVAC-R program supports the college value statements through its commitment to building a better workforce for the region. For example, the program has twice met with industry partners to discuss how the program can more closely align to the needs of the industry within our region. The goal of these meetings is to increase the quality and support available for students as they transition from college to the workforce. It is also the goal of the department to be responsive to the needs of the industry, so a program revision will be occurring in the near future.

2. **Program Data and Trend Analysis**

   Data will be supplied by Institutional Research. Faculty will be asked to respond to the trends found within the data. (See *Appendix B in the Periodic Program Review Guide for Faculty 2015* for detailed listing of the data sets.)

   2.1. Data

   2.1.1. *Program Resources (Profit/Loss)*: Please provide commentary on the program resources data points related to program revenue and expenses. Please comment on the adequacy of program resources, including such things as classroom and office space, laboratory space (if applicable), library and technology resources, and personnel.

   2.1.1.1. *Program resources—To more fully serve the students, additional equipment and supplies are necessary. Oxygen, acetylene and nitrogen are needed to provide a better lab experience. Also, additional refrigerants, including R-22, R-404A, R-134A and R-410A are necessary so that students can work with the variety of refrigerants in the industry. We will need additional supplies of Volt/Ohm meters, flaring tools, and manifold gauges. Classroom and lab spaces for now; but a freezer/cooler box located outside the lab would provide additional training opportunities. Library resources are adequate. A bookshelf needs to be purchased so that students have easier access to HVAC-specific materials in the classroom or lab. A better computer/projector system in Room 304 of BHC Campus needs to be added. The lab assistant is a great help for the program in Bullhead City.* Additional training aids are highly recommended to bring the program more up to date to industry standards. Additional personnel may be necessary if the program transitions to a competency-based model.

   2.1.2. *Student Metrics*: Please provide commentary on the student metrics related to program success. Please comment on the adequacy of student metrics as they effect the program under review.

   2.1.2.1. In 2013, the loss of the resident faculty member in BHC caused some mild disruptions in the program. The associate faculty hired during 2013 were able to get through the remainder of the semester, but were limited on their ability to recruit or promote the program. The hire of a new resident faculty member re-established the program strength in BHC. The LHC program has not been able to establish a strong student base. As a result, courses are often at less-than-preferred enrollments and have, on-occasion been cancelled or switched, which has caused further disruption of the program. A revision of the program is slated for summer 2016 in order to

determine if a competency-based model will create a better foundation for the program and provide better overall student success at both BHC and LHC.

2.1.3. *Instructional Productivity*: Please provide commentary on the instructional productivity related to program success. Please comment on the trends found in this data.

2.1.3.1. Based on the meetings with industry partners, it has been discovered that the program lacks significant time in the lab environment, emphasizing thermostat problem solving and system troubleshooting skills. The certificates were originally designed too long for a single semester. The load is too great for a student to handle, so there are crossover courses every semester that cause confusion or create situations where students can't get financial aid for a portion of a certificate. The teacher to student ratio is adequate. There is currently minimal need for associate faculty, but that need will likely change with a revision to a competency-based model of instruction so that students have increased opportunity for lab-based instruction.

2.1.4. *Enrollment Trends*: Please provide commentary on the enrollment trends for the program(s).

2.1.4.1. Enrollment in BHC is steady. Enrollment in LHC has declined and is to the point that changes must be made to the program because it is not viable with the enrollment where it is.

2.1.5. *Faculty Data Points*: Please provide commentary on the faculty data points related to program success. Please comment on any trends or gaps found in the data.

2.1.5.1. None added.

2.1.6. *Other Data Points:* Please provide commentary on any additional data points reviewed for this review. None added.

2.2. Strengths, Weaknesses, Opportunities, Threats (SWOT)

2.2.1. What are the strengths of your program as indicated in the above data?

2.2.1.1. Highly qualified instructors

2.2.1.2. Location

2.2.1.3. Very high demand in the region for qualified service technicians

2.2.1.4.

2.2.2. What are the weaknesses of your program as indicated in the above data?

2.2.2.1. Out-of-date training equipment reduces student appeal

2.2.2.2. Limited lab space forces students to work in teams and limits hands-on opportunities

2.2.2.3.

2.2.3. What opportunities exist for your program based on the above data?

2.2.3.1. Expansion of program could include sheet metal fabrication equipment to increase hiring value for graduates

2.2.3.2. Competency-based education model would provide increased student time in hands-on exercises

2.2.3.3. Industry partners want to be highly involved in support of the program.

2.2.4. What threats exist for your program based on the above data?

2.2.4.1. High level of expense to keep equipment current with the industry

2.2.4.2. Hiring of qualified faculty is a problem in the region

2.2.4.3. Student interest is sometimes difficult due to the perceptions of the "hard work" involved in the career.

3. **Assessment of Student Learning**

3.1. What percentage of courses have identified student learning outcomes (SLOs)? (comment of progress/lack of progress)

100% of courses have student learning outcomes

3.2. What percentage of courses have ongoing SLO assessment? (comment on progress/lack of progress)

HVA 150 Refrigeration and Electrical Troubleshooting was utilized for the Cycle of Learning Report.

3.3. How has assessment of course level SLOs led to improvements in student learning and achievement?

The hands-on nature of the assessment created an interest and commitment to investigate increasing lab time and competency-based instructional models.

3.4. How has assessment of program-level SLOs led to improvements in transfer or certificate/degree awards?

The data was the first collected, and thus it is too early to determine how the information will improve transfer or completion of certificates and degrees.

3.5. What challenges remain to make course and program level SLOs more effective?

The revision of Summer 2016 will embed assessment into all student learning outcomes.

4. **Evaluation of Progress Toward Previous Goals**

   4.1. Evaluate steps taken to achieve goals established in the last periodic program review.

   This is the first program review for this department.

   4.2. In cases where resources were allocated towards goals, evaluate the efficacy of that spending.

   There were no additional resources allocated toward goals prior to this assessment period.

5. **Program Goals and Plan**

   5.1. Short-term Goals (two year cycle): Based on the above data and analyses, identify 2 or more concrete goals, measurable outcomes, and activities that you would anticipate resulting in improvements to the program in the next 2-year cycle.

   Goal 1: (Goals describe what you wish to accomplish in support of program improvement.)
   Achieve industry standards and incorporate the competency-based model of instruction
   Measurable Outcome: Updated program and new equipment for that program
   Plan: (Briefly describe how you will accomplish this goal.) A revision of the program will occur during Summer 2016.
   Responsible Party(ies): Resident Faculty, Associate Dean of CTE, other staff as needed

   Goal 2: Update HVAC-R curriculum to meet industry expectations
   Measurable Outcome: The HVAC-R curriculum will be revised during Summer 2016
   Plan: Data collection has already occurred. Revision will begin early June.
   Responsible Party(ies): Resident Faculty, Associate Dean of CTE, other staff as needed

   What specific aspects of these goals can be accomplished without additional financial resources? None. Financial resources will be required for summer stipends and equipment and supply needs. Also lab and classroom spaces will likely required a certain amount of refreshing.

   5.2. Long-term Goals (four year cycle): Based on the above data and analyses, identify 2 or more concrete goals, measurable outcomes, and activities that you would anticipate resulting in improvements to the program within the next six years.

   Goal 1: (Goals describe what you wish to accomplish in support of program improvement.)
   Modernized, industry-reflective program

Measurable Outcome: All equipment and training will be maintained at industry standards.

Plan: (Briefly describe how you will accomplish this goal.) Pursue HVAC Excellence accreditation

Responsible Party(ies): Resident Faculty, Associate Dean of CTE, assorted staff, as necessary, Office of Compliance

Goal 2: Have a program that meets NATE standards

Measurable Outcome: Curriculum and equipment will reflect the NATE standards

Plan:

Responsible Party(ies): Resident Faculty, Associate Dean of CTE, assorted staff, as necessary, Office of Compliance

What specific aspects of these goals can be accomplished without additional financial resources? Much of the initial preparation can be accomplished prior to application for accreditation.

6. Requests for Resources

For any specific aspect of a goal listed in 5.0 that would require additional financial resources, complete the form below.

Type of Resource	Requested Amount	Potential Funding Source
Personnel	• Two full-time lab assistant Estimated salary cost: $60000	
Facilities		
Equipment	• Training aids • Oxy/acetylene/nitrogen tanks • VOM • Flaring tools • Pressure Gauges Estimated total cost: $400,000	Could be added to Perkins Grant Some could be included in STEM funding
Supplies	Copper, tin, sheet metal, welding gases, refrigerants Estimated annual cost: $5000	
Computer Hardware	New instruction station New projection equipment Student workstations Estimated cost: $10000	
Computer Software		
Training	Annual Conferences Industry Training Estimated Annual cost: $10000	
Other	$	
Total Requested Amount	$485,000	Much of this amount could be covered by committing

		Perkins dollars over 3-5 year period.

6.1. Describe the resource request(s). Numbers have been presented as a recommendation toward the transition to competency-based education.
6.2. What program outcome(s) does the resource request(s) address? Updating of technology, closely aligned outcomes with industry standards, better-trained instructors
6.3. What measurable outcome(s) will result from filling this resource request? unknown at this time

7. **Executive Summary**
   - Please list 3 – 5 strengths of the program(s). Location, industry demand, highly qualified instructor, instructor desire to remain current with the industry
   - Please list 3 – 5 areas of enhancement for the program(s). updating equipment, restructuring the program, refreshing the lab space, streamlined curriculum
   - Please identify ways the department will address student learning (assessment efforts, curricular redesign, etc.). embedding of assessment into all competencies will be a part of the competency based model
   - Based on programmatic analysis, please list 2 – 3 specific questions or areas which you would like the program reviewers to comment on or make recommendations. none
   - Identify any requests for resources that result from this review. Requests for resources will be extensive and part of the Summer 2016 revision process.