

# 1. Assessment Plan - Four Column



## PIE - Technology & Health: Air Conditioning & Refrigeration Unit

### Narrative Reporting Year

**2017-18**

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**External Conditions, Trends, or Impacts:** 1. The HVAC & R industry has stratified skill requirements. New control technologies in the building automation and energy management sector of the HVAC industry require approximately 20% of program completers enter the industry with a foundation in digital controls, network architecture, and programming. The other 80% require the skills necessary to work in the physically demanding roles of construction, installation, service and repair as mechanical, installation, and electrical technicians. This results in a stratification of technical skill level that the AIRC and BAS programs must adjust to.

2. College affiliates participating with the BEST (Building Efficiency for a Sustainable Tomorrow) Center through Laney College report low enrollments in their building automation programs. Low enrollment in community college building automation programs is being reported by all BEST Center members and participants. The BEST Center is the only organization representing building automation educators. Recruitment methods are a significant part of the BEST workshops and meetings.

3. Workplace safety based on OSHA standards is changing the operation of many HVAC and BAS businesses. This program needs to infuse OSHA standard safety into the AIRC and BAS curriculum.

4. Air conditioning systems utilizing inverter controlled compressors for Variable Refrigerant Volume (key term) are being specified more in new construction and new installations. The equipment saves energy by eliminating the use of ductwork. For this technology to be included in the program's curriculum, faculty members will have to participate in significant training and professional development. In addition, the mechanical and electrical labs will need to be modified over a period of + or - 3 years.

5. HCFC refrigerants have had very negative effects on ozone depletion and climate change. As a result, in 2012 the EPA reduced the amount of HCFC refrigerants available in the US market by 45%. This caused the price of refrigerants required in the AIRC mechanical lab to rise by more than 300%. Since the EPA has sequentially reduced production of HCFC refrigerants resulting in a 600% price increase over 2012 levels.

**Internal Conditions, Trends, or Impacts :** 1. Low enrollment in the BAS Program has continued since the DOL grant ended. From Fall 2013 to Summer 2015, eight (8) BAS courses were offered. During that time period, three out of eight course offerings were dropped because of low enrollment. Of the courses that ran, enrollment averaged 83% fill at census and 67% fill at the end of the session. Without marketing intervention and consistent subject matter expert representation, enrollment in the BAS program may continue to fall.

2. Faculty members in the AIRC department need to participate in significant training and professional development to learn and infuse Variable Refrigerant Volume (VRV) technology and VRV systems into the classroom and the curriculum.

3. Many of the Air Conditioning and Refrigeration systems used as lab trainers in the AIRC mechanical lab date back to the 1970's and 1980's. These trainers have always served the department's instructional needs because the systems are durable and the components are clearly visible. The refrigerants these older systems use, however, have been phased out because their destructive environmental properties. It has become prohibitively expensive to maintain the lab trainers that use HCFC refrigerants. It is more cost effective to replace existing older systems with newer, more efficient, and environmentally compatible equipment that use HFC and HFO refrigerants.

4. The electrical lab has used the same components for the last 25+ years. These various electrical components have exceeded their life expectancy and quite cost intensive to maintain. These components also are quite dated and are not aligned with current technology found in the newer equipment installed today. The lab could significantly benefit from much needed new components and carry the department forward into the next decade.

5. The mechanical lab space suffers from proper and adequate efficient lighting. The lighting in this space suffers from continuous bulb failure, low and dim lighting conditions and expensive bulb replacement to the college. Converting to high bay fluorescent or LED lighting fixtures would enable the shop to have a better lighted environment as well as a safer area for students to work on their projects.

**Critical Decisions Made by Unit:** The department has implemented a new fast track program to give students the opportunity to truly finish the Air Conditioning Certificate within a one year time-frame. The impact that this will have is that in the Winter 2018 and on semesters, there will be a need for additional adjunct faculty to fill additional sections.

**Notable Achievements for Theme A: To Advance Academic Excellence and Student Achievement:** 1. The department is involved in marketing strategies for the BAS courses and in such participated in a video promotion through Doing What Matters. This video was added to the AIRC home page and includes Mt SAC faculty in interviews.

2. The HVAC/R program has been awarded the Gold Star rating through strong workforce for meeting three metrics in wage earner increase, job placement in similar field of study, and attainment of regional living wage.

**Notable Achievements for Theme B: To Support Student Access and Success:** 1. A new Fast Track pathway has been created to offer students the opportunity to complete the Air Conditioning certificate within a one year time-frame. This was created to meet the needs of industries future workforce for growth and retirement.

**Notable Achievements for Theme C: Secure Human, Technological, & Financial Resources:** 1. The department was able to secure funding through the use of Perkins. This allowed the department to purchase and install new Variable Refrigerant Flow equipment for instructional use in the Basic and Advanced Mechanical courses.

2. We are the recipient of Strong Workforce dollars and this money will be used to build a photo voltaic grid that will power up a Variable Refrigerant system along with battery backup. This will allow students to be exposed and understand alternative energy sources as it applies to our industry.

**Notable Achievements for Theme D: To Foster an Atmosphere of Cooperation and Collaboration:** 1. The department is engaged with Citrus, LA Trade Tech, and El Camino college on a collaborative to work towards Zero Net Energy technology and theory to be incorporated into classroom instruction.

**Contributors to the Report:** Lanny Richardson -AIRC

Darrow Soares - AIRC

David Hering - AIRC

Fred Kobzoff - AIRC

### *Unit Goals*

### *Resources Needed*

### *Where We Make an Impact: Closing the Loop on Goals and Plans*

**Support BAS Program - BAS** enrollment will need to be improved and marketing efforts will be

**No Funding Requested -** Redefine the Building Automation Program. CTE Enhancement funds

**Reporting Year:** 2017-18  
**% Completed:** 100  
 The advisory committee has met and has provided direction

<i>Unit Goals</i>	<i>Resources Needed</i>	<i>Where We Make an Impact: Closing the Loop on Goals and Plans</i>
<p>undertaken in the Fall of 2017 to evaluate what measures should be taken to meet this criteria.  <b>Status:</b> Active  <b>Goal Year(s):</b> 2016-17, 2017-18  <b>Date Goal Entered (Optional):</b> 03/08/2018</p>	<p>will pay for this inquiry.  <b>Describe Plans &amp; Activities Supported:</b> Through the advisory committee, the department will update the curriculum to make it more relevant to the trade as well as more appealing to potential students.  <b>Lead:</b> Richardson/ Soares/  <b>Type of Request:</b> Research Support  <b>Planning Unit Priority:</b> Medium  <b>What would success look like and how would you measure it?:</b> Increased enrollment  <b>Full Funding Requested -</b> infuse Variable Refrigerant Volume technology into the AIRC and BAS curriculum.  <b>Lead:</b> Soares/ Kobzoff/  <b>One-Time Funding Requested (if applicable):</b> 35000  <b>Type of Request:</b> Instructional Equipment, Professional Development  <b>Planning Unit Priority:</b> Medium  <b>What would success look like and how would you measure it?:</b> HVAC Excellence Employment readiness exam.</p>	<p>for the department. The curriculum and certificate/degree have been modified and sent forward to the educational design committee for approval. (05/31/2018)</p> <p><b>Reporting Year:</b> 2017-18  <b>% Completed:</b> 25  Alternative energy savings projects are currently under way and will be completed by the end of the 2018 calendar year. (05/31/2018)</p> <hr/> <p><b>Reporting Year:</b> 2017-18  <b>% Completed:</b> 0  A number of VRV systems have been installed and will become operational in the 2017-2018 school year. There is another system currently in the process of being installed which also will incorporate Photo-voltaic (solar panels) to power the system so students can get exposure to this new technology when working within this environment. The college was under a moratorium for photo-voltaic installation and the department had to change its plans since it was not able to move ahead with the installation due to the funding source (grant related) needing to be spent. (03/08/2018)</p>
<p><b>Full time faculty hire -</b> A retirement, for a full time faculty member, will occur at the end of the 2017 - 2018 academic year and a replacement will need to be hired.  <b>Status:</b> Active  <b>Goal Year(s):</b> 2016-17, 2017-18</p>	<p><b>Report directly on Goal</b></p> <hr/> <p><b>Full Funding Requested -</b> Replace a</p>	<p><b>Reporting Year:</b> 2017-18  <b>% Completed:</b> 0  The department is currently developing a scheduling plan, for courses, that will be beneficial to students and faculty dealing with the deficiency of the retiring faculty. (03/08/2018)</p>

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<p><b>Date Goal Entered (Optional):</b> 09/01/2016</p>	<p>full time faculty that will be retiring  <b>Describe Plans &amp; Activities Supported:</b> Division support, HR support, College support  <b>Lead:</b> Richardson, Lanny  <b>On-Going Funding Requested (if applicable):</b> 100000  <b>Planning Unit Priority:</b> High  <b>What would success look like and how would you measure it?:</b> Certificate and Degree awards.  <b>Documentation Attached?:</b> No</p>	
<p><b>Support BAS Program 2</b> - Acquire equipment and controls to support the BAS program on an ongoing basis to meet the technological advances the industry is taking.  <b>Status:</b> Active  <b>Goal Year(s):</b> 2016-17, 2017-18, 2018-19, 2019-20, 2020-21  <b>Date Goal Entered (Optional):</b> 03/08/2018</p>	<p><b>Full Funding Requested</b> - Industry support and advisory  <b>Describe Plans &amp; Activities Supported:</b> To ensure that the department has the relevant technology to meet current industry practices as well as professional development to implement current and new technologies.  <b>Lead:</b> Richardson, Lanny  <b>Type of Request:</b> Professional Development  <b>Planning Unit Priority:</b> Low  <b>Documentation Attached?:</b> No</p>	<p><b>Reporting Year:</b> 2017-18  <b>% Completed:</b> 50  The department has secured some additional equipment to support the Building Automation Program. These new items will allow the department to maintain relevancy and currency. It has also strengthened the relationship between a major manufacturer, Automated Logic Corporation, and the BAS program at Mt SAC. The equipment has been received and the installation process is ongoing. Faculty will need additional training to fully realize the systems. (03/08/2018)</p>
<p><b>Technological relevance</b> - Provide students relevant mechanical equipment that is current with industry standards as well as technological standards.  <b>Status:</b> Active  <b>Goal Year(s):</b> 2016-17, 2017-18  <b>Date Goal Entered (Optional):</b> 07/13/2017</p>	<p><b>Report directly on Goal</b></p>	<p><b>Reporting Year:</b> 2017-18  <b>% Completed:</b> 25  The department has received funding, through a strong workforce grant, and is currently in the process of purchasing new mechanical equipment. The new equipment includes new modern and efficient furnaces, new air delivery systems, energy monitoring and data logger systems. (03/08/2018)</p>
	<p><b>Full Funding Requested</b> - Replacement package units and furnaces</p>	

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**Describe Plans & Activities**  
**Supported:** Many of the Air Conditioning and Refrigeration systems used as lab trainers in the AIRC mechanical lab date back to the 1970's and 1980's. These trainers have always served the department's instructional needs because the systems are durable and the components are clearly visible. The refrigerants these older systems use, however, have been phased out because their destructive environmental properties. It has become prohibitively expensive to maintain the lab trainers that use HCFC refrigerants. It is more cost effective to replace existing older systems with newer, more efficient, and environmentally compatible equipment that use HFC and HFO refrigerants.  
**Lead:** Richardson, Lanny  
Kobzoff, Fred  
**One-Time Funding Requested (if applicable):** 50000  
**Planning Unit Priority:** High  
**What would success look like and how would you measure it?:** HVAC Excellence Employment readiness exam  
**Documentation Attached?:** No

<p><b>Support Electrical Instruction -</b>  Replace electrical components used in the Basic and Advanced Electrical course offerings  <b>Status:</b> Active  <b>Goal Year(s):</b> 2016-17, 2017-18  <b>Date Goal Entered (Optional):</b></p>	<p><b>Report directly on Goal</b></p> <hr/> <p><b>Full Funding Requested -</b>  Replacement components for</p>	<p><b>Reporting Year:</b> 2017-18  <b>% Completed:</b> 0  The department is still seeking and awaiting funding to replace and update the electrical lab with new and relevant components. (03/08/2018)</p>
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07/13/2017	<p>electrical Lab space</p> <p><b>Describe Plans &amp; Activities</b>  <b>Supported:</b> The electrical lab has used the same components for the last 25+ years. These various electrical components have exceeded their life expectancy and quite cost intensive to maintain. These components also are quite dated and are not aligned with current technology found in the newer equipment installed today. The lab could significantly benefit from much needed new components and carry the department forward into the next decade.  <b>Lead:</b> Richardson, Lanny  <b>One-Time Funding Requested (if applicable):</b> 12000  <b>Planning Unit Priority:</b> High  <b>What would success look like and how would you measure it?:</b> HVAC Excellence employment readiness exam  <b>Documentation Attached?:</b> No</p>	
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<p><b>Empower student success</b> - Create or continue efforts to aid student employment opportunities.  <b>Status:</b> Active  <b>Goal Year(s):</b> 2016-17, 2017-18, 2018-19, 2019-20, 2020-21  <b>Date Goal Entered (Optional):</b> 07/13/2017</p>	<p><b>Full Funding Requested</b> - Time and effort by program faculty. Ongoing Division support. Catering for after event lunch/dinner - \$1,000.</p> <p><b>Describe Plans &amp; Activities</b>  <b>Supported:</b> Annual speed interviews that bring industry partners and students together that hopefully lead to permanent careers with those same companies.  <b>Lead:</b> Darrow Soares, Lanny Richardson, Fred Kobzoff</p>	<p><b>Reporting Year:</b> 2017-18  <b>% Completed:</b> 0  To date, the Air Conditioning program has a 95% placement success rate. An average of 21 industry partners have participated annually over the last two years. The interview process has been ongoing since 2012 with smaller numbers but has grown substantially over the years. The department will be providing interview opportunities, for students, in June of 2018 to further maintain our employment numbers., (03/08/2018)</p> <p>: This effort will be continued as long as industry supports it and we see no cause for slowing down in the foreseeable future. (08/21/2017)</p>
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	<p><b>On-Going Funding Requested (if applicable):</b> 1000  <b>Type of Request:</b> Marketing  <b>Planning Unit Priority:</b> Medium  <b>What would success look like and how would you measure it?:</b> Criteria will be based on the number of students securing an internship within industry.</p>	
<p><b>Marketing</b> - Participate or implement marketing efforts to promote the Air Conditioning and Building Automation programs.  <b>Status:</b> Active  <b>Goal Year(s):</b> 2016-17, 2017-18, 2018-19, 2019-20, 2020-21  <b>Date Goal Entered (Optional):</b> 08/21/2017</p>	<p><b>Report directly on Goal</b></p> <hr/> <p><b>Full Funding Requested</b> - To create marketing videos/posters/literature that can be used internally as well as externally to promote our programs.  <b>Describe Plans &amp; Activities</b>  <b>Supported:</b> To participate in marketing efforts that highlight the need for qualified technicians graduating from Mt SAC.  <b>Lead:</b> Lanny Richardson  <b>Type of Request:</b> Marketing  <b>Planning Unit Priority:</b> Medium  <b>What would success look like and how would you measure it?:</b> Industry feedback  <b>Documentation Attached?:</b> Yes  <b>Related Documents:</b>  <a href="#">Zero Net Energy means Career Opportunities</a></p>	<p><b>Reporting Year:</b> 2017-18  <b>% Completed:</b> 25  The department has created a number of posters for internal marketing purposes and is in the process of furthering our marketing efforts to industry. (05/31/2018)</p> <hr/>
<p><b>Facilities</b> - The mechanical lab space requires upgrading the lighting in this space to improve the quality and efficiency of lighting to provide students with a safe environment.</p>	<p><b>Report directly on Goal</b></p>	<p><b>Reporting Year:</b> 2017-18  <b>% Completed:</b> 0  This issue was listed on past PIE reports but was removed without explanation. It is being reinstated as a request as it is still an issue. (05/31/2018)</p>

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Lighting issues result in the use of portable lighting necessities to ensure students can work on their project in a safe and comfortable manor.  
**Status:** Active  
**Goal Year(s):** 2017-18  
**Date Goal Entered (Optional):** 05/31/2018

**Full Funding Requested** - Lighting retrofit to high bay fluorescent or LED lighting  
**Describe Plans & Activities**  
**Supported:** Lighting improvement to allow students to perform lab projects in a safe manner and enhance the learning environment.  
**Lead:** Lanny Richardson  
**Type of Request:** Facilities  
**Planning Unit Priority:** High  
**What would success look like and how would you measure it?:**  
Improved student performance measured by improved project score results.