

**Eastern Center for Arts and Technology**

**Program Review**

**Final Report**

**HVAC**

**2018**

### Occupational Advisory Committee Members

Paul DellaMonica	Delbar Heating & Air Conditioning
Nicholas F. Ciasullo III	R.D. Bitzer Co. Inc.
Mark Rossi	Rossi Mechanical
Mark Goodman	Grove Supply
David Parkes	David Parkes Company
Zachary Doucette	Student Representative
Charles Olbrish	Former Student Representative
Dave Ulrich	Former Student Representative

### Executive Advisory Committee Representative

Gary Bissig	LabRep Co.
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## Occupational Outlook

Job prospects for HVAC Technicians, mechanics and installers are expected to be excellent, particularly for those with training from an accredited technical school or with formal apprenticeship training.

The U.S. Department of Labor, Bureau of Labor Statistics, predicts a growing number of HVAC Mechanics and Installers. Employment of HVAC Mechanics and Installers is projected to grow much faster than average 14% or higher through the years of 2014 - 2024.

Pennsylvania labor statistics predict that HVAC Technician employment is expected to grow from approximately 321,000 in 2014 to approximately 459,000 in 2024. Employment of HVAC mechanics and installers is expected to grow faster than average through 2024. Demand for residential, commercial and industrial climate control systems will increase as the population and economy grow. Those who have attended technical school or formal training will have the best opportunities. Technicians who specialize in installation work may experience periods of unemployment when the level of new construction activity has declined and the economy is at a low point. Service work tends to remain relatively stable through lulls in the economy.

## **Summary of Graduate Placement**

HVAC students entered related employment and post-secondary schooling at a rate of 74% on average for the years 2012-2016 compared to EASTERNS average of 71% over the same time period. HVAC achieved 100% placement in the 2015-2016 school year. It is important to note that 79% of students on average achieved the EASTERN completion standard of a final grade of 70% or higher and completion of all tasks in the career objective during the years 2012 up to 2017. The completion rate yearly has been on the decline since 2014 however.

## **Current Program Status and Plans for Growth**

The HVAC Technology program has been experiencing several years of growth. Since 2014, students have had a uniform requirement, enhancing the professional atmosphere of the program and the environment. Since the 2014-2015 school year, the percentage of students enrolling at a post-secondary trade school, college, or university after completing the program has increased each year.

All students (100%) have earned industry certificates in 2017 with a goal of all students earning a certificate yearly.

NOCTI scores have improved. From 2012 to 2014, 85 to 100% of students earned the rating of Competent or Advanced on the exam. In 2014-2016 the number of students earning Competent or Advance dropped to a low of 46.2%. This number rebounded to 80% for the school year 2016-2017. Increased use of study guides, OAC assistance and item analysis of each section not meeting standards has assisted in the improvement of scores. These activities continue in the effort to increase the NOCTI Competent and Advanced percentages. EASTERNS school

wide goal is to achieve 91% of students taking the NOCTI to earn the rating of Competent or Advanced.

### **Program Viability**

Currently the HVAC program at EASTERN is experiencing growing enrollment. Great effort has been placed on marketing the HVAC program and the benefits it could provide for students in their future. EASTERN has visited participating school with HVAC students during college fairs to get the HVAC Program better exposure.

The HVAC Occupational Advisory Committee recommends and supports the continuation of the HVAC program at EASTERN. This recommendation is due to the continuing market demand for technicians, improved placement rates of graduates, and increased industry needs. Input from local contractors support the demand for technicians in the industry. The current class size is 24 students with an estimated 14 returning students for the 2018-19 school year.

### **Summary of Industry Trends**

Trends indicate that the HVAC industry is responding to a robust market. This market is influenced by concern for energy conservation, environmental responsibility and technological advancements.

HVAC energy-efficiency is a key focus currently and in the coming years. Many of the systems for the upcoming years are designed to be more eco- friendly to

reduce operational and energy costs, improve building automation, and better meet the green building standard.

Concern for more energy- efficient equipment is one of the trends continuing to push the HVAC field to improve. Emphasis on better energy management should lead to the replacement of older systems and the installation of newer, more efficient systems in existing homes and buildings. Also, demand for building automation is another area the HVAC industry is trying to improve. Building automation systems (BAS) have microprocessors that track and transfer environmental and data changes to controllers. BAS adjusts lighting and indoor air quality to reduce electric costs. The increase in energy awareness has spurred the demand for green building which is expected to double every three years. LED lighting, variable refrigerant flow and solar power are just some solutions that take the industry by storm. Software plays a big role today in HVAC design, data analysis, repair, and maintenance. Sensors help track a unit's condition, usage patterns and other data needed to improve product design. Qualified technicians must keep current with industry trends and technological advances in electrical/electronic and energy management systems available today.

Technicians need to possess communication skills to work with customers and employers. Most technicians work in residences and places of employment. It is essential that they be able to communicate problems to customers and do so sincerely. Further, communication with employers is equally important. A "business sense" is an essential skill as a technician grows within the industry. Industry training is important to keep pace with industry trends. Students need to be educated and certificated in current advancements and technologies to make

them employable and an asset to the industry. To assure the students are current the instructor must stay current in new energy conservation methods, environmental and technological advances.

#### Program Specific Questions-HVAC

**What are the current and/or new certifications available for students in the program?**

Current Certifications in the HVAC industry are OSHA, Tracpipe, Gastight and The EPA Refrigerant Handling certification. Students at Eastern are currently getting the OSHA, Tracpipe and Gastight certifications. The OAC recommends students get the EPA Refrigerant Handling Certification. The instructor needs to complete the EPA Refrigerant Handling certification and train the trainer certification in order to instruct and then test the students.

**Are there any changes in regards to “Green Technology” that may affect the program and the perspective industry?**

The committee does feels that as the industry changes Green Technology is a part of that change and will be a natural occurrence. At this time the OAC recommends continuation of the Program of Study as is and any potential green technology topics by considered as Expanded Learning Opportunity presentations.

**Environmental protection is an increasing factor in the planning and conduct of many businesses. What are the considerations that must be addressed in the curriculum to facilitate these concerns (i.e. OSHA regulations, safety concerns, chemical usage and disposal.)**

EASTERN has always and will continue to follow the safety requirements set forth by OSHA and the HVAC industry. Students are required to complete OSHA 10

during their course time and the committee recommends the continuation of this certification.

### **Skills And Credentials Required For Employment**

Students completing this program should have the opportunity to earn an industry recognized credential or certification, Professional certifications and credentials offer excellent opportunities for skill acquisition and enhancement, career advancement, in addition to being recognized for one's commitment to professional growth. In the HVAC program students are now getting certified in Trac pipe, Gastight and OSHA.

In conjunction with professional certifications and credentials, articulations and post-secondary education can provide students opportunities to grow and excel in the HVAC industry. Students who choose to enter Heating ventilation and air-conditioning technology, plumbing, and heating and air conditioning and will benefit from post-secondary credit. Many potential "jobs" in these career areas may require some post-secondary credit. Articulation agreements are one avenue to assist students to attain college credit while they are still in high school. Some of the schools that the program has articulations with are Delaware County Community College, Johnson College, Northampton County Community College, Thaddeus Stevens College of Technology and Penn Technology.

### **Recommendations:**



Based on industry trends, the committee makes the following recommendations:

**Recommendation 1:**

- Change the appearance of the program by painting and replacing tables for the lab.
- Replace air conditioner units (3), furnaces (3) and heating coils (3) over the three-year period. The preferred vendor is Luxaire HVAC equipment made by Johnson Controls. Competitors Trane and Carrier are premium brands and according to the committee are not the industry standard. Trane and Carrier sell direct to contractors and advertise on television extensively. The Luxaire equipment is what is currently used in the lab and the committee recommends that this is the preferred brand for student instruction. This equipment is used daily for student practice and a continual replacement cycle is warranted.

**Recommendation 2:**

- Purchase a Pittsburgh machine to instruct students on bending techniques. The Pittsburgh Lock Former 36" allows the students to make and produce plenums and duct work and put a locking edge on the metal to be able to lock the material together. The Pennsylvania program of study task list requires that students "compare, identify and fabricate using various duct materials" (Task 906). The industry uses pre-fabricated duct work or produces by hand. The purchase of a Pittsburgh machine will teach students this "by hand production technique". While prefabrication is the future, the OAC sees value in hand production and

would like add this machine to our list of lab equipment. All effort to secure a used Pittsburgh machine should be extended.

### **Recommendation 3:**

- Instructor to earn EPA Refrigerant Handling certification/ EPA instructor credentials to be able to provide instruction and certification to students on a set schedule.

### **Timeline**

#### **Phase One – 2018-2019**

• Paint the shop	\$3000.00
• Replacement table for the lab	\$1992.00
• Luxaire 95.5% Furnace (1) replacement	\$737.00
• Luxaire 2T 17.c Heating coils (1)-replacement	\$287.00
• Luxaire AC units (1)-replacement	\$671.00
Total	\$6,687.00

#### **Phase Two – 2019-2020**

• Pittsburgh machining	\$3928.00
• Luxaire 95.5% Furnace (1) replacement	\$737.00
• Luxaire 2T 17.c Heating coils (1)-replacement	\$287.00
• Luxaire AC units (1)-replacement	\$671.00
• EPA Refrigerant Handling certification	\$100.00

Total	\$5,723.00
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**Phase Three – 2020-2021**

- Luxaire 95.5% Furnace (1) replacement \$737.00
- Luxaire 2T 17.c Heating coils (1)-replacement \$287.00
- Luxaire AC units (1)-replacement \$671.00

Total	\$1,695.00
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**Program Review Total: \$14,105.00**

Eastern Center for Arts and Technology

HEATING, VENTILATION AND AIR CONDITIONING

Program Review Implementation Status

October 2018

ITEM	DUE DATE	STATUS
Paint the shop	2018-19	
Replacement table for the lab	2018-19	
Luxaire 95.5% Furnace (1) replacement	2018-19	
Luxaire 2T 17.c Heating coils (1)-replacement	2018-19	
Luxaire AC units (1)-replacement	2018-19	
Pittsburgh machine	2019-20	
Luxaire 95.5% Furnace (1) replacement	2019-20	
Luxaire 2T 17.c Heating coils (1)-replacement	2019-20	
Luxaire AC units (1)-replacement	2019-20	
EPA Refrigerant Handling certification	2019-20	
Luxaire 95.5% Furnace (1)-replacement	2020-21	
Luxaire 2T 17.c Heating coils (1)-replacement	2020-21	
Luxaire AC units (1)-replacement	2020-21	