

# HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION TECHNOLOGY

## Heating, Ventilation, Air Conditioning and Refrigeration Technology

### Certificate

The Heating, Ventilation, Air Conditioning and Refrigeration (HVACR) field will prepare students to service, repair, install, maintain and troubleshoot mechanical systems in the residential industry. These mechanical systems include; heating, cooling and indoor air quality.

Career preparation requires extensive educational training in high temperature refrigeration systems, electrical controls, cooling/heating systems, duct design, duct fabrication, and residential heat gain and loss calculations. Additional key skills implemented in the program include; customer service, attention to detail, troubleshooting and diagnosing problems, time management, dismantling and reassembling of mechanical systems.

Some of the opportunities for employment in Heating, Ventilation, Air Conditioning and Refrigeration include: equipment installers, maintenance, service and repair.

### Associate of Applied Science

The Heating, Ventilation, Air Conditioning and Refrigeration (HVACR) field will prepare students to install, maintain and troubleshoot mechanical systems in commercial, residential and industrial environments. These mechanical systems include heating, cooling, ventilation of indoor environments and refrigeration.

Heating, Ventilation, Air Conditioning and Refrigeration (HVACR) technicians are primarily trained in the service, repair, maintenance and installation of equipment including residential, commercial and industrial systems. Technicians are also trained in maintaining cooling/heating systems in order to save energy consumption by implementing advance technology controls.

Career preparation requires extensive educational training in refrigeration systems, electrical controls, pneumatic controls, cooling/heating systems, duct design, duct fabrication and residential/commercial heat gain and loss calculations. Additional key skills implemented in the program include customer service, attention to detail, troubleshooting and diagnosing problems, time management, dismantling and reassembling of mechanical systems.

Some of the opportunities for employment in Heating, Ventilation, Air Conditioning and Refrigeration include engineers in sales, application and operating, equipment installers, preventive maintenance, service and repair, wholesale and sheet metal specialist.

### Program Learning Outcomes Certificate

1. Students will demonstrate safety practices.
2. Demonstrate the use of HVACR testing tools to troubleshoot residential air conditioning systems and their components.
3. Apply industry standards to do load calculation with air distribution layout.
4. The students will be able to safely wire and install residential air conditioning equipment and evaluate system performance.

### Associate of Applied Science

1. Students will demonstrate chilled water system concept.
2. Demonstrate the use of HVACR testing tools to troubleshoot commercial air conditioning systems and their components.
3. Analyze and compare medium and low temperature system refrigeration equipment sequence of operation and accessories.
4. Apply industry standards to test and balance airflow.
5. Students will be able to read commercial construction blueprints for service and installation procedures.

## Advisory Committee Members

Jay Villegas, Frontier Air Conditioning – Committee President  
Rick Andreatos, National Commercial Equipment Repair  
Rudy Cantu, Goodman  
Albert Cortez, Walmart  
Matt Cypher, Cytech Heating and Cooling  
Adolfo De Leon, Crimson Refrigeration  
Juan Garcia, Garcia AC Service  
Adolfo Gonzalez, Johnstone Supply  
Sarah Hammond, Atlas Electrical, Air Conditioning, Refrigeration & Plumbing Services, Inc.  
Luis Hess, Hess Air  
Steven Mojica, CoolSys Refrigeration  
Frank Nunez, Johnson Supply  
Arnold Ramirez, Gemaire Distributors  
Ruben Sanchez, Colair Inc.  
Sergio Sanchez, InSCO Distributing  
Jose Luis Vazquez, Perry Mechanical  
Robert Villarreal, Standard Supply & Distributing Co Inc  
Joe Villegas, Frontier Air Conditioning  
Norma Yado, City of McAllen  
Joe Yarrison, Joe's Comfort Air  
Edgar Zamora, RGV Extreme Air Services

### Certificate

- Heating, Ventilation, Air Conditioning and Refrigeration Technology Certificate (p. 1)

### Associate Degree

- Heating, Ventilation, Air Conditioning and Refrigeration Technology Associate of Applied Science (p. 2)

## Heating, Ventilation, Air Conditioning and Refrigeration Technology Certificate

### TSI Exempt

Course	Title	Credit Hours
Fall		
HART 1401	Basic Electricity for HVAC	4
HART 1407	Refrigeration Principles	4
HART 1410	HVAC Shop Practices and Tools	4
Credit Hours		12

<b>Spring</b>		
HART 1445	Gas and Electrical Heating	4
HART 2431	Advanced Electricity for HVAC	4
HART 2445	Residential Air Conditioning Systems Design	4
HART 2438	Capstone: Air Conditioning Installation and Startup	4
<b>Credit Hours</b>		<b>16</b>
<b>Total Credit Hours</b>		<b>28</b>

# Heating, Ventilation, Air Conditioning and Refrigeration Technology Associate of Applied Science

## TSI Liable

Course	Title	Credit Hours
<b>First Year</b>		
<b>Fall</b>		
HART 1401	Basic Electricity for HVAC	4
HART 1407	Refrigeration Principles	4
HART 1410	HVAC Shop Practices and Tools	4
ENGL 1301	Composition I <sup>1</sup>	3
<b>Credit Hours</b>		<b>15</b>
<b>Spring</b>		
HART 2431	Advanced Electricity for HVAC	4
HART 2445	Residential Air Conditioning Systems Design	4
HART 2438	Capstone: Air Conditioning Installation and Startup	4
HART 1445	Gas and Electrical Heating	4
<b>Credit Hours</b>		<b>16</b>
<b>Second Year</b>		
<b>Fall</b>		
HART 2434	Advanced Air Conditioning Controls	4
HART 2441	Commercial Air Conditioning	4
HART 2442	Commercial Refrigeration	4
Math Elective <sup>1</sup>		3-4
<b>Credit Hours</b>		<b>15-16</b>
<b>Spring</b>		
SPCH 1311	Introduction to Speech Communication	3
HART 2588	Internship - Heating, Air Conditioning, Ventilation and Refrigeration Maint. Technology/Technician	5
Humanities Elective <sup>1</sup>		3
Social and Behavioral Sciences Elective - Core Curriculum <sup>1</sup>		3
<b>Credit Hours</b>		<b>14</b>
<b>Total Credit Hours</b>		<b>60-61</b>

<sup>1</sup> Identifies courses to fulfill minimum 15 credit hour General Education requirement