

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

### Associate of Applied Science

1. Graduates will demonstrate chilled water system concept.
2. Graduates will demonstrate the use of HVACR testing tools to troubleshoot commercial air conditioning systems and their components.
3. Graduates will analyze and compare medium and low temperature system refrigeration equipment sequence of operation and accessories.
4. Graduates will apply industry standards to test and balance airflow.
5. Graduates 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, Inscos 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
<b>Fall</b>		
HART 1401	Basic Electricity for HVAC	4
HART 1407	Refrigeration Principles	4
HART 1410	HVAC Shop Practices and Tools	4
<b>Credit Hours</b>		<b>12</b>

<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