

# TDCJ AIR CONDITIONING/ REFRIGERATION

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- Air Conditioning/Refrigeration - TVCC AAS (<https://coursecatalog.tvcc.edu/tdcj-handbook/programs/air-conditioning-refrigeration/aas/>)
- Air Conditioning/Refrigeration – TVCC Certificate (<https://coursecatalog.tvcc.edu/tdcj-handbook/programs/air-conditioning-refrigeration/air-conditioning-refrigeration-certificate/>)

## Air Conditioning/Refrigeration Program Information

**Note: Criminal history may disqualify individuals from obtaining or maintaining any HVAC certifications.**

### TEXAS LAW:

- restricts the issuance of occupational licenses based on a license applicant's criminal history; and
- authorizes the Texas Department of Licensing and Regulation (TDLR), in some cases, to consider a person convicted, even though the person was only on probation or community supervision without a conviction.

Individuals who have been convicted of an offense or placed on probation might not be eligible for an occupational license issued by TDLR even after completing an educational or training program.

TDLR's criminal history guidelines are available at [www.tdlr.texas.gov/crimconvict.htm](http://www.tdlr.texas.gov/crimconvict.htm) and include restrictions or guidelines TDLR uses to determine eligibility for an occupational license; and individuals have the right to request a criminal history evaluation letter from TDLR, which is explained in more detail at [www.tdlr/texas.gov/crimhistoryeval.htm](http://www.tdlr/texas.gov/crimhistoryeval.htm).

### **HART-1401. Basic Electricity for Hvac. (4 Credits)**

This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. Principles of electricity as required by HVAC, including proper use of test equipment, electrical circuits, and component theory and operation.

### **HART-1403. Air Conditioning Control Principles. (4 Credits)**

This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. A basic study of HVAC and refrigeration controls; troubleshooting of control components; emphasis on use of wiring diagrams to analyze high and low voltage circuits; a review of Ohm's law as applied to air conditioning controls and circuits.

### **HART-1407. Refrigeration Principles. (4 Credits)**

This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. An introduction to the refrigeration cycle, heat transfer theory, temperature/pressure relationship, refrigerant handling, refrigeration components, and safety.

**HART-1441. Residential Air Conditioning. (4 Credits)**

This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. A study of components, applications, and installation of mechanical air conditioning systems including operating conditions, troubleshooting, repair, and charging of air conditioning systems.

**HART-1445. Gas and Electric Heating. (4 Credits)**

This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. A study of the procedures and principles used in servicing heating systems including gas fired and electric furnaces.

**HART-2449. Heat Pumps. (4 Credits)**

This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. A study of heat pumps, heat pump control circuits, defrost controls, auxiliary heat, air flow and other topics related to heat pump systems.

**WHAT HEATING, AIR CONDITIONING, AND REFRIGERATION MECHANICS AND INSTALLERS DO**

Heating, air conditioning, and refrigeration mechanics and installers—often called *HVACR technicians*—work on heating, ventilation, cooling, and refrigeration systems that control the temperature and air quality in buildings.

**DUTIES**

Heating, air conditioning, and refrigeration mechanics and installers typically do the following:

- Install, clean, and maintain HVACR systems
- Install electrical components and wiring
- Inspect and test HVACR systems and components
- Discuss system malfunctions with customers
- Repair or replace worn or defective parts
- Recommend maintenance to improve system performance
- Keep records of work performed

Heating and air conditioning systems control the temperature, humidity, and overall air quality in homes, businesses, and other buildings. By providing a climate-controlled environment, refrigeration systems make it possible to store and transport food, medicine, and other perishable items.

Some HVACR technicians specialize in one or more specific aspects of HVACR, such as radiant heating systems, solar panels, testing and balancing, or commercial refrigeration.

When installing or repairing air conditioning and refrigeration systems, technicians must follow government regulations regarding the conservation, recovery, and recycling of refrigerants. The regulations include those concerning the proper handling and disposal of fluids and pressurized gases.

Some HVACR technicians sell service contracts to their clients, providing periodic maintenance of heating and cooling systems. The service usually includes inspecting the system, cleaning ducts, replacing filters, and checking refrigerant levels.

Other workers sometimes help HVACR technicians install or repair cooling and heating systems. For example, on a large air conditioning installation job, especially one in which workers are covered by union contracts, ductwork may be installed by sheet metal workers, electrical work by electricians, and pipework by plumbers, pipefitters, and steamfitters. Boiler systems are sometimes installed by a boilermaker.

Home appliance repairers usually service window air conditioners and household refrigerators.

## **SUMMARY**

- Heating, air conditioning, and refrigeration mechanics and installer
- 2021 Median Pay: \$48,630 per year, \$23.38 per hour
- Typical Entry-Level Education: Postsecondary non-degree award
- Work Experience in a Related Occupation: None
- On-the-job Training: Long-term on-the-job training
- Number of Jobs, 2021: 394,100
- Job Outlook, 2021-31: 5% (As fast as average)
- Employment Change, 2021-31: 20,200

## **WORK ENVIRONMENT**

HVACR technicians work mostly in homes, schools, hospitals, office buildings, or factories. Their worksites may be very hot or cold because the heating and cooling systems they must repair may not be working properly and because some parts of these systems are located outdoors. Working in cramped spaces and during irregular hours is common.

## **HOW TO BECOME A HEATING, AIR CONDITIONING, OR REFRIGERATION MECHANIC AND INSTALLER**

Because HVACR systems have become increasingly complex, employers generally prefer applicants with postsecondary education or those who have completed an apprenticeship. Some states and localities may require technicians to be licensed.

## **PAY**

The median annual wage for heating, air conditioning, and refrigeration mechanics and installers was \$48,630 in 2021.

## **JOB OUTLOOK**

Employment of heating, air conditioning, and refrigeration mechanics and installers is projected to grow 5% from 2021 to 2031, slower than average for all occupations. Commercial and residential building construction is expected to drive employment growth, and job opportunities for HVACR technicians are expected to be good.

## STATE & AREA DATA

Explore resources for employment and wages by state and area for heating, air conditioning, and refrigeration mechanics and installers.

## SIMILAR OCCUPATIONS

Compare the job duties, education, job growth, and pay of heating, air conditioning, and refrigeration mechanics and installers with similar occupations.

## MORE INFORMATION, INCLUDING LINKS TO O\*NET

Learn more about heating, air conditioning, and refrigeration mechanics and installers by visiting additional resources, including O\*NET, a source on key characteristics of workers and occupations.

## SUGGESTED CITATION:

Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Heating, Air Conditioning, and Refrigeration Mechanics and Installers, on the Internet at <https://www.bls.gov/ooh/installation-maintenance-and-repair/heating-air-conditioning-and-refrigeration-mechanics-and-installers.htm> (visited May 31, 2023).

Some careers in this field will require a bachelor's degree.

- TVCC's AA degrees are fully transferable to public universities in Texas. See an academic advisor for more information on this transfer opportunity.
- Many of TVCC's AAS degrees lead to an online Bachelor of Applied Arts and Sciences (BAAS) degree with participating universities. See an academic advisor for more information on this transfer opportunity.