

HEATING, VENTILATION, AND AIR CONDITIONING TECHNOLOGY - HVA3

One of the fastest-growing service occupations, Heating, Ventilation and Air Conditioning has seen major changes over the past years as a result of the national emphasis on fuel conservation and environmental concerns.

Every private residence, business, industry and agency needs the skill of technicians trained in the installation, maintenance and repair of air conditioning, refrigeration and heating systems.

Students are trained to diagnose and repair malfunctions; size, fabricate and install air duct systems; and estimate cooling and heating loads for selection of the most efficient systems for a given building. Practical training in a well-equipped shop gives students on-the-job experience before they graduate. EPA technician certification is taught and the test is offered to all curriculum students.

Four certificate programs are offered: Introduction to HVAC - (Quickskills), HVACR Installers, Heating Fundamentals, and Refrigeration Applications.

Requirements

Courses	Course Title	Credit Hours
General Education Courses		
ENG 165	Professional Communications	3
MAT 170 or MAT 110	Algebra, Geometry and Trigonometry I College Algebra	3
MAT 171 or MAT 111	Algebra, Geometry and Trigonometry II College Trigonometry	3
Elective Social/Behavioral Sciences (https://catalog.ptc.edu/student-handbook/advising-registration/general-education-courses/)		3
Elective Humanities/Fine Arts (https://catalog.ptc.edu/student-handbook/advising-registration/general-education-courses/)		3
Subtotal		15
Required Core Subject Areas		
ACR 101	Fundamentals of Refrigeration	5
ACR 106	Basic Electricity for HVAC/R	4
ACR 110	Heating Fundamentals	4
ACR 122	Principles of Air Conditioning	5
ACR 160	Service Customer Relations	3
Subtotal		21
Other Courses Required for Graduation		
ACR 105	Tools and Service Techniques I	1
ACR 107	Wiring Diagrams	2
ACR 109	Tools and Service Techniques II	2
ACR 130	Domestic Refrigeration	4
ACR 131	Commercial Refrigeration	4

ACR 140	Automatic Controls	3
ACR 150	Basic Sheet Metal	2
ACR 210	Heat Pumps	4
ACR 223	Testing and Balancing	3
ACR 224	Codes and Ordinances	2
ACR 231	Advanced Refrigeration	4
CPT 101 or CPT 169	Introduction to Computers Industrial Computer Applications	3
Subtotal		34
Total Hours		70

Graduation Plan

Fall Start

Course	Title	Hours
First Year		
Fall Semester		
ACR 101	Fundamentals of Refrigeration	5
ACR 105	Tools and Service Techniques I	1
ACR 106	Basic Electricity for HVAC/R	4
ACR 150	Basic Sheet Metal	2
MAT 170 or MAT 120	Algebra, Geometry and Trigonometry I or Probability and Statistics	3
Hours		15

Spring Semester

ACR 109	Tools and Service Techniques II	2
ACR 131	Commercial Refrigeration	4
ACR 140	Automatic Controls	3
ENG 165	Professional Communications	3
MAT 171 or MAT 110	Algebra, Geometry and Trigonometry II or College Algebra	3
Hours		15

Summer Semester

ACR 107	Wiring Diagrams	2
ACR 130	Domestic Refrigeration	4
ACR 160	Service Customer Relations	3
CPT 101 or CPT 169	Introduction to Computers or Industrial Computer Applications	3
Hours		12

Second Year

Fall Semester

ACR 110	Heating Fundamentals	4
ACR 122	Principles of Air Conditioning	5
ACR 210	Heat Pumps	4
Elective Behavioral Science (https://catalog.ptc.edu/student-handbook/advising-registration/general-education-courses/)		3
Hours		16

Spring Semester

ACR 223	Testing and Balancing	3
ACR 224	Codes and Ordinances	2



ACR 231	Advanced Refrigeration	4
Elective Humanities/Fine Arts (https://catalog.ptc.edu/student-handbook/advising-registration/general-education-courses/)		3
Hours		12
Total Hours		70

Spring Start

Course	Title	Hours
First Year		
Spring Semester		
CPT 101 or CPT 169	Introduction to Computers or Industrial Computer Applications	3
ENG 165	Professional Communications	3
MAT 170 or MAT 120	Algebra, Geometry and Trigonometry I or Probability and Statistics	3
Elective Behavioral Science (https://catalog.ptc.edu/student-handbook/advising-registration/general-education-courses/)		3
Elective Humanities/Fine Arts (https://catalog.ptc.edu/student-handbook/advising-registration/general-education-courses/)		3
Hours		15

Summer Semester

ACR 107	Wiring Diagrams	2
ACR 130	Domestic Refrigeration	4
ACR 160	Service Customer Relations	3
MAT 171	Algebra, Geometry and Trigonometry II	3
Hours		12

Fall Semester

ACR 101	Fundamentals of Refrigeration	5
ACR 105	Tools and Service Techniques I	1
ACR 106	Basic Electricity for HVAC/R	4
ACR 150	Basic Sheet Metal	2
Hours		12

Second Year

Spring Semester

ACR 109	Tools and Service Techniques II	2
ACR 131	Commercial Refrigeration	4
ACR 140	Automatic Controls	3
Hours		9

Fall Semester

ACR 110	Heating Fundamentals	4
ACR 122	Principles of Air Conditioning	5
ACR 210	Heat Pumps	4
Hours		13

Third Year

Spring Semester

ACR 223	Testing and Balancing	3
ACR 224	Codes and Ordinances	2

ACR 231	Advanced Refrigeration	4
Hours		9
Total Hours		70

Application and Advising

If you are ready to start your education, there are a few simple steps involved in enrolling at Piedmont Technical College.

Get Started Today (<https://www.ptc.edu/admissions/new-students/>)

Advising Information

The following information provides a guide for advisors who are helping students enroll in this program.

Program Notes

It is best to start in the fall semester. Place students in ACR classes even if they need developmental coursework. If a student wishes to enroll during spring or summer term, advise for general education courses. A student may also enroll in ACR 109 in the spring. In the summer a new student may enroll in ACR 150 and ACR 160, but check with department head first.

Students will earn an A.A.S., Major in HVAC Technology (HVA3) by the completion of the Refrigeration Applications Certificate, the Heating Fundamentals Certificate and completion of (18 credit hours-which includes CPT 101 or CPT 169) of general education.

Courses are offered during day and evening hours

Top-quality tools, meter and gauges, which are required for this program, will cost \$500 - \$700. There is a list at the bookstore, or you can contact Bill Cockrell for more information.

Notes About Individual Classes

The English required for this program is ENG 165. Students will follow this progression, with their starting point being determined by their placement test scores: ENG 032/012 and/or RDG 032/012 (or RWR 032/012) > ENG 100 and/or RDG 100 (or RWR 100) > ENG 165.

The math required for this program is MAT 170. Students will follow this progression, with their starting point being determined by their placement test scores: MAT 032/012 > MAT 170.

Place students in ACR classes, as outlined in the Semester-by-semester graduation plan below, even if they need developmental coursework.

Program Student Learning Outcomes

Purpose Statement

Purpose Statement – The HVAC program is dedicated to assisting adult learners in the development of the skills and knowledge necessary to the student's success and to support their educational goals for employment and profession growth in the HVAC/R field. The program offers a wide range of credentials including the Associate in Applied Science Degree and two certificates in HVAC Technology.

Program Student Learning Outcomes

1. Install, repair and service most light commercial refrigeration systems.
2. Use a wiring schematic in troubleshooting most air conditioning, heating, and refrigeration systems.
3. Install and service most residential heat pump systems.
4. Use most of the tools and meters associated with the air conditioning and refrigeration industry.
5. Calculate residential heat loss and heat gain.
6. Test and balance air quantities in most heating and air conditioning systems.
7. Install and service most heating systems including gas, oil, and electric.
8. Apply safety rules and regulations when working.
9. Install, repair and maintain most domestic refrigeration systems.