

# Air Conditioning, Heating and Refrigeration Technology

The Air Conditioning, Heating and Refrigeration Technology (AHR) curriculum provides the basic knowledge for developing skills fundamental to working with residential and light commercial systems. Graduates can assist in the start-up, preventive maintenance, service, repair, and installation of residential and light commercial systems. A.A.S. graduates also can articulate an understanding of system selection, air balancing, building automation, system applications, and indoor air quality.

Topics include heating, comfort cooling, refrigeration, electricity, and schematic diagrams, along with residential and commercial controls methodologies. Two nationally recognized certificates in Building Automation are available, along with EPA 608 certification, as required by the Environmental Protection Agency for all technicians who handle refrigerants.

Most classes include extensive hands-on exposure and training with industry tools and instruments working on equipment types such as air conditioning, furnaces, heat pumps, mini-splits, and advanced, computer-controlled systems. Safety is integral to all coursework. Students are immersed in discussions around the mechanical and fuel gas codes, residential system sizing, advanced comfort systems, and indoor air quality, among other discipline discussions.

Throughout the program, students are exposed to the Critical Core, an articulated pathway for students to achieve proficiency in Critical Thinking, Communication (Written & Oral), Personal Growth & Cultural Literacy, and Information Technology & Quantitative Literacy. The Critical Core empowers all AHR students to achieve academic, professional, and personal success.

For specific information about potential positions and wages in air conditioning, heating, and refrigeration employment, visit the Central Piedmont Career Coach website.

## Air Conditioning, Heating and Refrigeration Technology (A35100)

### Degree Awarded

An A.A.S. Degree in Air Conditioning, Heating and Refrigeration Technology is awarded by the college upon completion of this program.

### Admissions

- Completion of a high school diploma is required for entering A.A.S. program.
- Many courses have prerequisites or co-requisites; check the Courses section for details.

### Contact Information

The Air Conditioning, Heating and Refrigeration Technology program is in the Skilled Trades Division. For more information, call the program office at 704-330-2722 ext 7437.

### General Education Requirements

ENG 111	Writing and Inquiry	3.0
ENG 112	Writing and Research in the Disciplines	3.0
COM 231	Public Speaking	3.0
Take 1 course from the following:		3.0
MAT 110	Mathematical Measurement and Literacy	
MAT 171	Precalculus Algebra	
Select 3 credits of the following:		3.0
ECO 251	Principles of Microeconomics	
ECO 252	Principles of Macroeconomics	
HIS 111	World Civilizations I	
HIS 112	World Civilizations II	
HIS 131	American History I	
HIS 132	American History II	
POL 120	American Government	
PSY 150	General Psychology	
SOC 210	Introduction to Sociology	
Select 3 credits of the following:		3.0
ART 111	Art Appreciation	
ART 114	Art History Survey I	
ART 115	Art History Survey II	
DRA 111	Theatre Appreciation	
HUM 120	Cultural Studies	
HUM 130	Myth in Human Culture	
MUS 110	Music Appreciation	
MUS 112	Introduction to Jazz	
PHI 215	Philosophical Issues	
PHI 240	Introduction to Ethics	
REL 110	World Religions	

### Major Requirements

AHR 110	Introduction to Refrigeration	5.0
AHR 112	Heating Technology	4.0
AHR 113	Comfort Cooling	4.0
AHR 114	Heat Pump Technology	4.0
AHR 115	Refrigeration Systems	2.0
AHR 211	Residential System Design	3.0
AHR 212	Advanced Comfort Systems	4.0
AHR 213	HVACR Building Code	2.0
AHR 235	Refrigeration Design	3.0
WOL 110	Basic Construction Skills	3.0
ELC 111	Introduction to Electricity	3.0

### Other Major Requirements

AHR 130	HVAC Controls	3.0
AHR 151	HVAC Duct Systems I	2.0
AHR 160	Refrigerant Certification	1.0
AHR 180	HVACR Customer Relations	1.0
BPR 130	Print Reading-Construction	3.0

### Technical Electives

Select 2 credits of the following:		2.0
ACA 122	College Transfer Success	
AHR 215	Commercial HVAC Controls	
AHR 255	Indoor Air Quality	

AHR 263	Energy Management	
WBL 111	Work-Based Learning I	
WBL 112	Work-Based Learning I	
WLD 112	Basic Welding Processes	
Total Credits		67

## Air Conditioning, Heating and Refrigeration Technology - HVAC-R Controls Track (A35100C) Degree Awarded

An A.A.S. Degree in Air Conditioning, Heating and Refrigeration Technology is awarded by the college upon completion of this program.

### Admissions

- Completion of a high school diploma is required for entering A.A.S. program.
- Many courses have prerequisites or co-requisites; check the Courses section for details.

### Contact Information

For more information, call the program office at 704.330.4446 or the Construction Technologies Division at 704.330.4408.

#### General Education Requirements

ENG 111	Writing and Inquiry	3.0
ENG 112	Writing and Research in the Disciplines	3.0
COM 231	Public Speaking	3.0
Select one course from the following:		3.0
MAT 110	Mathematical Measurement and Literacy	
MAT 171	Precalculus Algebra	
Select one course from the following:		3.0
ECO 251	Principles of Microeconomics	
ECO 252	Principles of Macroeconomics	
HIS 111	World Civilizations I	
HIS 112	World Civilizations II	
HIS 131	American History I	
HIS 132	American History II	
POL 120	American Government	
PSY 150	General Psychology	
SOC 210	Introduction to Sociology	
Select one course from the following:		3.0
ART 111	Art Appreciation	
ART 114	Art History Survey I	
ART 115	Art History Survey II	
DRA 111	Theatre Appreciation	
HUM 120	Cultural Studies	
HUM 130	Myth in Human Culture	
MUS 110	Music Appreciation	
MUS 112	Introduction to Jazz	
PHI 215	Philosophical Issues	
PHI 240	Introduction to Ethics	
REL 110	World Religions	

#### Major Core Requirements:

AHR 110	Introduction to Refrigeration (Major Core Requirements)	5.0
AHR 112	Heating Technology	4.0
AHR 113	Comfort Cooling	4.0
AHR 114	Heat Pump Technology	4.0
AHR 211	Residential System Design	3.0
AHR 212	Advanced Comfort Systems	4.0
AHR 213	HVACR Building Code	2.0
ELC 111	Introduction to Electricity (Other Required Coursework)	3.0
AHR 130	HVAC Controls	3.0
<b>Other major requirements:</b>		
AHR 160	Refrigerant Certification	1.0
AHR 180	HVACR Customer Relations	1.0
AHR 215	Commercial HVAC Controls	2.0
AHR 255	Indoor Air Quality	2.0
AHR 263	Energy Management	2.0
BPR 130	Print Reading-Construction	3.0
WOL 110	Basic Construction Skills	3.0
Select three hours from the following courses:		3.0
ACA 122	College Transfer Success	
ARC 225	Architectural Building Information Modeling I	
ELC 117	Motors and Controls	
ELC 125	Diagrams and Schematics	
ELC 128	Introduction to Programmable Logic Controller	
WBL 110	World of Work	
WBL 111	Work-Based Learning I	
WBL 121	Work-Based Learning II	
Total Credits		67

## No diplomas are offered in Air Conditioning, Heating and Refrigeration Technology.

The specialization certificates listed below can be earned in the Air Conditioning, Heating and Refrigeration (A35100) program.

### Air Conditioning, Heating and Refrigeration Technology Certificate (C35100)

- Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in Refrigeration Systems (C35100-C5 (p. 3))
- Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in Apartment/Rental Maintenance (C35100-C9) (p. 3)
- Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in HVAC-R Industry Introduction (C35100-11) (p. 3)
- Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in Residential Service (C35100-13) (p. 3)
- Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in Indoor Air Quality and Comfort (C35100-14) (p. 3)
- Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in Energy Management & Building Automation (C35100-15) (p. 3)

- Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in Advanced HVAC-R Controls (C35100-16) (p. 3)
- Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in HVAC Installation (C35100-53) (p. 3)

## Requirements

- Completion of a high school diploma or equivalent is encouraged as the foundation of a career in this area.
- Many courses have prerequisites or co-requisites; check the Courses section for details.

## Contact Information

For more information, call the program office at 704.330.4479 or the Skilled Trades Division at 704.330.4408.

### Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in Refrigeration Systems (C35100-C5)

#### Major Requirements

AHR 110	Introduction to Refrigeration	5.0
ELC 111	Introduction to Electricity	3.0
AHR 130	HVAC Controls	3.0
AHR 115	Refrigeration Systems	2.0
AHR 180	HVACR Customer Relations	1.0
AHR 235	Refrigeration Design	3.0
Total Credits		17

### Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in Apartment/Rental Maintenance (C35100-C9)

#### Major Requirements

AHR 110	Introduction to Refrigeration	5.0
AHR 160	Refrigerant Certification	1.0
AHR 180	HVACR Customer Relations	1.0
ELC 113	Residential Wiring	4.0
WOL 110	Basic Construction Skills	3.0
Total Credits		14

### Air Conditioning, Heating and Refrigeration Technology Certificate Specialization in HVAC-R Industry Introduction (C35100-11)

#### Major Requirements

AHR 110	Introduction to Refrigeration	5.0
AHR 160	Refrigerant Certification	1.0
AHR 180	HVACR Customer Relations	1.0
AHR 151	HVAC Duct Systems I	2.0
ELC 111	Introduction to Electricity	3.0
WOL 110	Basic Construction Skills	3.0
BPR 130	Print Reading-Construction	3.0
Total Credits		18

### Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in Residential Service (C35100-13)

#### Major Requirements

AHR 112	Heating Technology	4.0
AHR 113	Comfort Cooling	4.0
AHR 114	Heat Pump Technology	4.0
AHR 130	HVAC Controls	3.0
Total Credits		15

### Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in Indoor Air Quality and Comfort (C35100-14)

#### Major Requirements

AHR 130	HVAC Controls	3.0
AHR 211	Residential System Design	3.0
AHR 212	Advanced Comfort Systems	4.0
AHR 213	HVACR Building Code	2.0
AHR 255	Indoor Air Quality	2.0
AHR 263	Energy Management	2.0
Total Credits		16

### Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in Energy Management & Building Automation (C35100-15)

#### Major Requirements

AHR 130	HVAC Controls	3.0
AHR 211	Residential System Design	3.0
AHR 212	Advanced Comfort Systems	4.0
AHR 213	HVACR Building Code	2.0
AHR 215	Commercial HVAC Controls	2.0
AHR 263	Energy Management	2.0
Total Credits		16

### Air Conditioning, Heating & Refrigeration Technology Certificate Specialization in Advanced HVAC-R Controls (C35100-16)

#### Major Requirements

AHR 130	HVAC Controls	3.0
AHR 215	Commercial HVAC Controls	2.0
AHR 263	Energy Management	2.0
ELC 117	Motors and Controls	4.0
ELC 125	Diagrams and Schematics	2.0
ELC 128	Introduction to Programmable Logic Controller	3.0
Total Credits		16

### Air Conditioning, Heating and Refrigeration Technology Certificate Specialization in HVAC Installation (C35100-53)

AHR 110	Introduction to Refrigeration	5.0
AHR 112	Heating Technology	4.0
AHR 151	HVAC Duct Systems I	2.0

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AHR 160	Refrigerant Certification	1.0
AHR 213	HVACR Building Code	2.0
ELC 111	Introduction to Electricity	3.0
WBL 121M	Work-Based Learning II	1.0
Total Credits		18