

Construction Technologies

Air Conditioning, Heating, and Refrigeration Technology

Credential: Associate in Applied Science in Air Conditioning, Heating, & Refrigeration Degree A35100

The Air Conditioning, Heating, and Refrigeration Technology curriculum provides the basic knowledge to develop skills necessary to work with residential and light commercial systems. Topics include mechanical refrigeration, heating and cooling theory, electricity, controls, and safety. The diploma program covers air conditioning, furnaces, heat pumps, tools and instruments. In addition, the AAS degree covers residential building codes, residential system sizing, and advanced comfort systems. AAS degree graduates should be able to demonstrate an understanding of system selection and balance and advanced systems.

Program Length: 6 semesters

Program Location: Center for Workforce Innovation/Howard James Industry Training Center

Course requirements for Air Conditioning, Heating, and Refrigeration Technology Degree

1. General Education Requirements (15 SHC) C-L-SHC

English – Take one course:

ENG 110	Freshman Composition	3-0-3
ENG 111	Writing & Inquiry	3-0-3

Communications – Take one course:

COM 110	Introduction to Communication	3-0-3
COM 120	Intro Interpersonal Com	3-0-3
COM 231	Public Speaking	3-0-3
ENG 112	Writing/Research in the Disc	3-0-3
ENG 114	Prof Research & Reporting	3-0-3
ENG 115	Oral Communication	3-0-3
ENG 116	Technical Report Writing	3-0-3

Mathematics/Sci – Take one course:

MAT 110	Math Measurement & Literacy	2-2-3
MAT 143	Quantitative Literacy	2-2-3
PHY 121	Applied Physics I	3-2-4

Humanities/Fine Arts requirement	3
Social/Behavioral Science requirement	3

2. Major Requirements (29 SHC)

AHR 110	Intro to Refrigeration	2-6-5
AHR 111	HVACR Electricity	2-2-3
AHR 112	Heating Technology	2-4-4
AHR 113	Comfort Cooling	2-4-4
AHR 114	Heat Pump Technology	2-4-4
AHR 211	Residential System Design	2-2-3
AHR 212	Advanced Comfort Systems	2-6-4
AHR 213	HVACR Building Code	1-2-2

3. Other Major Requirements (18 SHC)

AHR 115	Refrigeration Systems	1-3-2
AHR 125	HVACR Electronics	2-2-3

AHR 133	HVAC Servicing	2-6-4
AHR 151	HVAC Duct Systems I	1-3-2
AHR 160	Refrigerant Certification	1-0-1
AHR 180	HVACR Customer Relations	1-0-1
AHR 215	Commercial HVAC Controls	1-3-2
AHR 225	Commercial System Design	2-3-3

4. Other Requirements (2 SHC)

WBL 111	Work-Based Learning I	0-10-1
ACA 122	College Transfer Success	0-2-1

Total Semester Hours Credit required for graduation: 64

Air Conditioning, Heating & Refrigeration Technology

Credential: Diploma D35100

Program Length: 4 Semesters

Program Location: Howard-James Industry Training Center

Course requirements for Air Conditioning, Heating & Refrigeration Technology Diploma:

1. General Education Requirements (6 SHC)

English – Take one course from:

ENG 110	Freshman Composition	3-0-3
ENG 111	Writing and Inquiry	3-0-3

Mathematics – Take one course from:

MAT 110	Math Measurement & Literacy	2-2-3
MAT 143	Quantitative Literacy	2-2-3
PHY 121	Applied Physics I	3-2-4

2. Major Requirements (20 SHC)

AHR 110	Intro to Refrigeration	2-6-5
AHR 111	HVACR Electricity	2-2-3
AHR 112	Heating Technology	2-4-4
AHR 113	Comfort Cooling	2-4-4
AHR 114	Heat Pump Technology	2-4-4

3. Other Major Requirements (13 SHC)

AHR 115	Refrigeration Systems	1-3-2
AHR 160	Refrigerant Certification	1-0-1
AHR 125	HVACR Electronics	2-2-3
AHR 133	HVAC Servicing	2-6-4
AHR 151	HVAC Duct Systems I	1-3-2

4. Other Requirements (1 SHC)

ACA 122	College Transfer Success	0-2-1
---------	--------------------------	-------

Total Semester Hours Credit Required for Gradation: 39

Air Conditioning, Heating & Refrigeration Technology
Credential: ACHR Tech Basic Certificate
C35100B

Program Length: 4 Semesters
 Program Location: Howard-James Industry Training Center

Course requirements for ACHR Tech Basic Certificate:

I. Major Requirements (17 SHC)

AHR 110	Intro to Refrigeration	2-6-5
AHR 112	Heating Technology	2-4-4
AHR 113	Comfort Cooling	2-4-4
AHR 114	Heat Pump Technology	2-4-4

II. Other Major Requirements (1 SHC)

AHR 160	Refrigerant Certification	1-0-1
---------	---------------------------	-------

Total Semester Hours Credit Required for Graduation: 18

Air Conditioning, Heating & Refrigeration Technology
Credential: ACHR Tech Core I Certificate
C35100C1

Program Length: 2 Semesters
 Program Location: Howard-James Industry Training Center

Course requirements for ACHR Tech Core I Certificate:

1. Requirements (12 SHC)

AHR 110	Intro to Refrigeration	2-6-5
AHR 111	HVACR Electricity	2-2-3
AHR 113	Comfort Cooling	2-4-4

Total Semester Hours Credit Required for Graduation: 12

Air Conditioning, Heating & Refrigeration Technology
Credential: ACHR Tech Core II Certificate
C35100C2

Program Length: 3 Semesters
 Program Location: Howard-James Industry Training Center

Course requirements for ACHR Tech Core II Certificate:

1. Major Requirements (9 SHC)

AHR 114	Heat Pump Technology	2-4-4
AHR 211	Residential System Design	2-2-3
AHR 213	HVACR Building Code	1-2-2

2. Other Major Requirements (3 SHC)

AHR 115	Refrigeration Systems	1-3-2
WBL 111	Work-Based Learning I	0-10-1

Total Semester Hours Credit Required for Graduation: 12

Air Conditioning, Heating & Refrigeration Technology
Credential: ACHR Tech Intermediate Certificate
C35100I

Program Length: 4 Semesters
 Program Location: Howard-James Industry Training Center

Course requirements for ACHR Tech Intermediate Certificate:

I. Requirements (18 SHC)

AHR 115	Refrigeration Systems	1-3-2
AHR 125	HVACR Electronics	2-2-3
AHR 133	HVAC Servicing	2-6-4
AHR 151	HVAC Duct Systems I	1-3-2
AHR 215	Commercial HVAC Controls	1-3-2
AHR 225	Commercial System Design	2-3-3
AHR 180	HVACR Customer Relations	1-0-1
WBL 111	Work-Based Learning I	0-10-1

Total Semester Hours Credit Required for Graduation: 18

Electrical Systems Technology
Credential: Associate in Applied Science in Electrical Systems Technology
A35130

This curriculum is designed to provide training for persons interested in the installation and maintenance of electrical systems found in residential, commercial, and industrial facilities.

Coursework, most of which is hands-on, will include such topics as AC/DC theory, basic wiring practices, programmable logic controllers, industrial motor controls, applications of the National Electric Code, and other subjects as local needs require.

Graduates should qualify for a variety of jobs in the electrical field as an on-the-job trainee or apprentice assisting in the layout, installation, and maintenance of electrical systems.

Program Length: 5 semesters
 Program Location: Chatham Main Campus

Course requirements for Electrical Systems Technology Degree:

1. General Education (15 SHC)		C-L-SHC
English – Take one course:		
ENG 110	Freshman Composition	3-0-3
ENG 111	Writing & Inquiry	3-0-3
Communications – Take one course:		
COM-110	Introduction to Communications	3-0-3
COM 120	Intro Interpersonal Com	3-0-3
COM 231	Public Speaking	3-0-3

ENG 112	Writing/Research in the Disc	3-0-3
ENG 114	Prof Research & Reporting	3-0-3
ENG 115	Oral Communication	3-0-3
ENG 116	Technical Report Writing	3-0-3
Mathematics – Take one course:		
MAT 110	Math Measurement & Literacy	2-2-3
MAT 143	Quantitative Literacy	2-2-3
Humanities/Fine Arts requirement		3-0-3
Social/Behavioral Science Requirement		3-0-3

2. Major Requirements (16 SHC)

ELC 112	DC/AC Electricity	3-6-5
ELC 113	Residential Wiring	2-6-4
ELC 117	Motors and Controls	2-6-4
ELC 128	Intro to PLC	2-3-3

Concentration Requirements (12 SHC)

ELC 114	Commercial Wiring	2-6-4
ELC 118	National Electrical Code	1-2-2
ELC 119	NEC Calculations	1-2-2
ELN 131	Analog Electronics I	3-3-4

3. Other Major Requirements (21 SHC)

ALT 120	Renewable Energy Tech	2-2-3
BPR 130	Print Reading – Construction	3-0-3
BUS 110	Intro to Business	3-0-3
ELC 127	Software for Technicians	1-3-2
ELC 220	Photovoltaic Sys Tech	2-3-3
ELN 132	Analog Electronics II	3-3-4
ISC 121	Envir Health & Safety	3-0-3

4. Other Required (2 SHC)

WBL 111	Work-Based Learning I	0-10-1
ACA 122	College Transfer Success	1-0-1

Total Semester Hours Credit required for graduation: 66

Electrical Systems Technology**Credential: Diploma****D35130C**

Program Length: 3 Semesters

Program Location: Chatham Main Campus

Course requirements for Electrical Systems Technology Diploma:**1. General Education Requirements (6 SHC)**

English – Take one course:

ENG 110	Freshman Composition	3-0-3
ENG 111	Writing & Inquiry	3-0-3

Social Science/Behavioral Science		3-0-3
-----------------------------------	--	-------

2. Major Requirements (24 SHC)

ELC 112	DC/AC Electricity	3-6-5
ELC 113	Residential Wiring	2-6-4
ELC 114	Commercial Wiring	2-6-4
ELC 117	Motors and Controls	2-6-4
ELC 128	Introduction to PLC	2-3-3

ELN 131	Analog Electronics I	3-3-4
---------	----------------------	-------

3. Other Major Requirements (10 SHC)

ELC 118	National Electric Code	1-2-2
ELC 119	NEC Calculations	1-2-2
ELC 127	Software for Technicians	1-3-2
ISC 121	Envir Health & Safety	3-0-3
ACA 122	College Transfer Success	0-2-1

Total Semester Hours Credit Required for Gradation: 40

Electrical Systems Technology**Credential: Certificate****C35130**

Program Length: 2 Semesters

Program Location: Chatham Main Campus

Course requirements for Electrical Systems Technology Certificate:**1. Requirements (17 SHC)**

ELC 112	DC/AC Electricity	3-6-5
ELC 113	Residential Wiring	2-6-4
ELC 114	Commercial Wiring	2-6-4
ELC 117	Motors and Controls	2-6-4

Total Semester Hours Credit Required for Graduation: 17

Building Construction Technology**Credential: Associate in Applied Science****Degree in Building Construction Technology****A35140**

A program that prepares individuals to apply technical knowledge and skills to residential and commercial building construction and remodeling. Includes instruction in construction equipment and safety, site preparation and layout; construction estimating; print reading; building codes; framing, masonry, heating, ventilation, and air conditioning; electrical and mechanical systems; interior and exterior finishing; and plumbing.

Program Length: 5 Semesters

Program Site: Chatham Main Campus

Course requirements for Associate in Applied Science Degree in Building Construction Technology

1. General Education Requirements (15 SHC)		C-L-SHC
MAT 121	Algebra/Trigonometry I	2-2-3
Humanities/Fine Arts Elective		3-0-3
Social/Behavioral Science Elective		3-0-3
ENG 111	Writing & Inquiry	3-0-3
Communications; Take one course:		
ENG 112	Writing/Research in the Disc	3-0-3
ENG 114	Prof Research & Reporting	3-0-3
COM 120	Intro Interpersonal Com	3-0-3

2. Major Requirements (24 SHC)

BPR 130	Print Reading Construction	3-0-3
CMT 120	Codes & Inspections	3-0-3
CST 241	Planning & Estimating I	2-2-3
SST 140	Green Building & Design Concepts	3-0-3
CST 111	Construction I	3-3-4
CST 112	Construction II	3-3-4
CST 221	Statics/Structures	3-3-4

3. Other Major Requirements (29 SHC)

ARC 111	Intro to Architecture	1-6-3
BUS 280	REAL Small Business	4-0-4
CST 113	Construction III	3-3-4
CST 131	OSHA/Safety/Certification	2-2-3
CST 150	Building Science	2-2-3
ELC 113	Residential Wiring	2-6-4
MAS 140	Intro to Masonry	1-2-2
PLU 111	Intro to Plumbing	1-3-2
SST 120	Energy Use Analysis	2-2-3
WBL 111	Work-based Learning I	0-10-1

4. Other Requirements (1 SHC)

ACA 122	College Transfer Success	0-2-1
---------	--------------------------	-------

Total Semester Hours Credit Required for Graduation: 69

**Building Construction Technology
Credential: Building Construction Technology
Diploma
D35140**

1. General Education Requirements (6 SHC)

MAT 121	Algebra/Trigonometry I	2-2-3
ENG 111	Writing & Inquiry	3-0-3

2. Major Requirements (20 SHC)

BPR 130	Print Reading Construction	3-0-3
CMT 120	Codes and Inspections	3-0-3
CST 111	Construction I	3-3-4
CST 112	Construction II	3-3-4
CST 241	Planning and Estimating I	2-2-3
SST 140	Green Building & Design Concepts	3-0-3

3. Other Major Requirements (15 SHC)

CST 113	Construction III	3-3-4
CST 131	OSHA/Safety/Certification	2-2-3
ELC 113	Residential Wiring	2-6-4
MAS 140	Intro to Masonry	1-2-2
PLU 111	Intro to Plumbing	1-3-2

Total Semester Hours Credit Required for Graduation: 41

**Building Construction Technology
Credential: Building Construction Technology
Certificate
C35140**

**Course requirements for Building Construction
Technology Certificate**

1. Major Requirements (8 SHC)		C-L-SHC
CST 111	Construction I	3-3-4
CST 112	Construction II	3-3-4

2. Other Major Requirements (7 SHC)

CST 113	Construction III	3-3-4
CST 131	OSHA/Safety/Certification	2-2-3

Total Semester Hours Required: 15

**Building Construction Technology
Credential: Masonry Diploma
D35280**

A program that prepares individuals to apply technical knowledge and skills in the laying and/or setting of exterior brick, concrete block, and related materials, using trowels, levels, hammers, chisels, and other hand tools. Includes instruction in technical mathematics, print reading, structural masonry, decorative masonry, foundations, reinforcement, mortar preparation, cutting and finishing, and applicable codes and standards

Program Length: 3 semesters
Career Pathway options: Diploma in Masonry
Program Site: Chatham Main Campus

ENG 102	Applied Communications II	3-0-3
MAT 110	Math Measurement & Literacy	2-2-3
MAS 110	Masonry I	5-15-10
BPR 130	Print Reading-Construction	3-0-3
MAS 120	Masonry II	5-15-10
MAS 130	Masonry III	6-6-8
ISC 110	Workplace Safety	1-0-1

Semester Hours Credit required for graduation: 38