

Grayson College Course Catalog

Overview

Grayson College's Heating, Air Conditioning and Refrigeration Technology program offers three levels of training and skills. Many students start with the Technician Apprentice Certificate, then build on those skills with the Technician Certificate. The highest level is the Associate of Applied Science degree. Grayson College's courses teach the skills recommended by area employers who work in the industry. The program is offered on the Main Campus in the Career as well as the South Campus, which is equipped with the latest technology.

Programs of study include:

- Technician Apprentice Certificate (16 hours)
- Technician Certificate (32 hours)
- Associate of Applied Science Degree (60 hours)

Course Requirements

Grayson College requires a high school diploma or equivalent. The Associate of Applied Science Degree requires successful completion of the TSI requirements. Interested students are strongly encouraged to get advised by a success coach or faculty advisor and follow a degree plan, as some courses are not available every semester.

Capstone Experience

To earn a certificate in this program, all students must successfully complete a comprehensive exit exam prior to graduation.

Local Employers

Advanced Cooling, Four Star Heating & Air Conditioning, Reynolds Electric & Air Conditioning, and Champion Cooler

AAS Degree Requirements

Associate of Applied Science Degree - Heating, Air Conditioning and Refrigeration Technology

Subject	Semester Hours
HART 1407 (Refrigeration Principles)	4
HART 1401 (Basic Electricity for HVAC)	4
ENGL 1301 (Composition I)	3
DFTG 1325 (Blueprint Reading)	3
* MATH 1314 , 1332 , or 1342	3
HART 1445 (Gas and Electric Heating)	4
HART 2442 (Commercial Refrigeration)	4
*Social/Behavioral Science	3
* SPCH 1311 , 1315 , or 1321	3
HART 2436 (Air Conditioning Troubleshooting)	4
*Lang, Phil, Culture/Creative Arts	3
*Math/Life & Physical Science Core	4
HART 2449 (Heat Pumps)	4
HART 2445 (Air Conditioning Systems Design)	4
DFTG 1317 (Architectural Drafting-Residential)	3
BUSG 2309 (Small Business Management)	3
HART 1441 (Residential Air Conditioning)	4
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HART 1445, HART 2442, HART 2436, HART 2445 and HART 1441 are taught on a rotating basis. Two classes every 3rd semester.

*Please review your Student Planner or contact your Student Success Coach/Faculty Mentor to review which courses may be used to fill this degree requirement.

Capstone Experience. All students must complete the capstone requirement: successful completion of a comprehensive exit exam prior to graduation.

Certificate Degree Requirements

Heating, Air Conditioning, and Refrigeration Technician Apprentice - Certificate

Subject	Semester Hours
HART 1407 (Refrigeration Principles)	4
HART 1401 (Basic Electricity for HVAC)	4
HART*	4
HART*	4
DFTG 1325 (Blueprint Reading)	3
Capstone Experience	
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*Any two of the six (6) remaining HART courses. HART 1445, HART 2442, HART 2449, HART 2436, HART 2445 and HART 1441 are taught on a rotating basis. Two classes every 3rd semester.

Capstone Experience. All students must complete the capstone requirement: successful completion of a comprehensive exit exam prior to graduation.

*Please review your Student Planner or contact your Student Success Coach/Faculty Mentor to review which courses may be used to fill this degree requirement.

Heating, Air Conditioning, and Refrigeration Technician - Certificate

Subject	Semester Hours
HART 1407 (Refrigeration Principles)	4
HART 1401 (Basic Electricity for HVAC)	4
HART*	4
HART*	4
DFTG 1325 (Blueprint Reading)	3
HART*	4
HART*	4
HART*	4
HART*	4
Capstone Experience	
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*All six (6) of the remaining HART courses.

Capstone Experience. All students must complete the capstone requirement: successful completion of a comprehensive exit exam prior to graduation.

HART 1401 - Basic Electricity for HVAC

Principles of electricity as required by HVAC technicians including proper use of test equipment, A/C and D/C circuits, and component theory and operation. Advanced electrical instruction and skill building in installation and servicing of air conditioning and refrigeration equipment including detailed instruction in motors and power distribution, motors, motor controls and application of solid state devices. The student will exhibit knowledge of basic principles of electricity, electrical current, circuitry, and A/C devices; apply Ohm's law to electrical calculations; perform electrical continuity, voltage and current tests with appropriate meters and demonstrate electrical safety.

Grade Basis: L

Credit hours: 4.0

Lecture hours: 3.0

Lab hours: 4.0

HART 1407 - Refrigeration Principles

An introduction to the refrigeration cycle, basic thermodynamics, heat transfer, temperature/pressure relationship, safety, refrigeration containment, and refrigeration components. The student will identify the components and explain the application and operation of the basic refrigeration cycle; explain theories of thermodynamics and heat transfer; demonstrate proper application and use of tools, test equipment, and safety procedures; and demonstrate accepted refrigeration applications.

Grade Basis: L

Credit hours: 4.0

Lecture hours: 3.0

Lab hours: 4.0

HART 1441 - Residential Air Conditioning

A study of components, applications, and installation of mechanical air conditioning systems including operating conditions, troubleshooting, repair, and charging of air conditioning systems. Demonstrate systems applications; implement and demonstrate industry accepted refrigerant charging procedures; demonstrate air conditioning system installation procedures; and demonstrate component and part diagnostics and replacement.

Grade Basis: L

Credit hours: 4.0

Lecture hours: 3.0

Lab hours: 2.0

Prerequisites:

- [HART 1401](#) - Basic Electricity for HVAC
 - [HART 1407](#) - Refrigeration Principles
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HART 1445 - Gas and Electric Heating

A study of the procedures and principles used in servicing heating systems including gas fired and electric furnaces. The student will identify different types of gas furnaces; identify and discuss component operation of gas furnaces; service and troubleshoot gas furnaces; perform safety inspections on gas and electric furnaces; identify unsafe operation of gas furnaces; identify and discuss component operation of electric furnaces; and service and troubleshoot electric furnaces.

Grade Basis: L

Credit hours: 4.0

Lecture hours: 3.0

Lab hours: 2.0

Prerequisites:

- [HART 1401](#) - Basic Electricity for HVAC
 - [HART 1407](#) - Refrigeration Principles
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HART 2436 - Air Conditioning Troubleshooting

An advanced course in application of troubleshooting principles and use of test instruments to diagnose air conditioning and refrigeration components and system problems including conducting performance tests.

Grade Basis: L

Credit hours: 4.0

Lecture hours: 3.0

Lab hours: 2.0

Prerequisites:

- [HART 1401](#) - Basic Electricity for HVAC
 - [HART 1407](#) - Refrigeration Principles
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HART 2442 - Commercial Refrigeration

Theory of and practical application in the maintenance of commercial refrigeration; high, medium, and low temperature applications and ice machines. The student will explain and apply high, medium, and low temperature systems operation, and explain and apply ice machine and packaged refrigeration system operation.

Grade Basis: L

Credit hours: 4.0

Lecture hours: 3.0

Lab hours: 2.0

Prerequisites:

- [HART 1401](#) - Basic Electricity for HVAC
 - [HART 1407](#) - Refrigeration Principles
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HART 2445 - Air Conditioning Systems Design

A study of the properties of air and results of cooling, heating, humidifying or dehumidifying; heat gain and heat loss calculations including equipment selection and balancing the air system. The student will calculate heat loss and heat gain; design a complete duct system; size heating and cooling equipment of the structure; perform a load calculation using Manual J.

Grade Basis: L

Credit hours: 4.0

Lecture hours: 4.0

Lab hours: 1.0

Prerequisites:

- [HART 1401](#) - Basic Electricity for HVAC
 - [HART 1407](#) - Refrigeration Principles
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HART 2449 - Heat Pumps

A study of heat pumps, heat pump control circuits, defrost controls, auxiliary heat, air flow, and other topics related to heat pump systems. The student will be able to explain a reverse cycle system; list the mechanical and electrical components for the heat pump operation; and explain the operation of heat pump modes including cooling, heating, defrost, emergency heat, and auxiliary heat mode. Identify and explain different methods of accomplishing defrost; charge a system correctly in the heating and cooling mode; troubleshoot electrical and mechanical components; perform tests for adequate air flow; and determine balance point and co-efficiencies of performance (C.O.P.); and define attributes of geothermal heat pump systems.

Grade Basis: L

Credit hours: 4.0

Lecture hours: 3.0

Lab hours: 2.0

Prerequisites:

- [HART 1401](#) - Basic Electricity for HVAC
 - [HART 1407](#) - Refrigeration Principles
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Grayson College

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