

## Heating, Air Conditioning & Refrigeration Technology

### *Associate of Applied Science Degree*

This curriculum prepares students for opportunities as refrigeration and air conditioning technicians. Instruction is given under actual shop conditions where students develop an understanding of the operation and performance of refrigeration and air conditioning systems and components. The refrigeration and air conditioning industry needs qualified technicians to satisfy the increasing production of refrigeration and air conditioning systems.

Freshman Year			
First Semester		Second Semester	
Subject	Semester Hours	Subject	Semester Hours
HART 1507	5	HART 1445	4
HART 1501	5	HART 1442	4
ENGL 1301	3	Social/Behavioral Science	3
Natural Science/Mathematics	3	SPCH	3
	16	Elective	4
			18

Sophomore Year			
First Semester		Second Semester	
Subject	Semester Hours	Subject	Semester Hours
HART 2434	4	HART 2545	5
HART 2436	4	DFTG 1317	3
DFTG 1305	3	WELD 1421	4
Social/Behavioral Science	3		12
Elective	4		
	18		

Students who desire Associate of Applied Science Degrees, see degree requirements.

**Exit Point I.** Installer certificate. Upon completion of HART 1501, 1507 and five or more semester hours of advanced classes, students will be eligible for a certificate.

**Exit Point II.** Technician certificate. Upon completion of the requirements in Exit Point I and the remaining HART courses (Total of seven HART courses), students will be eligible for a certificate.

**Capstone Experience.** Graduation with a Technicians Certificate or an Associate of Applied Science Degree in Heating, Air Conditioning and Refrigeration Technology requires successful completion of a comprehensive exit exam.

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**HART 1442. Commercial Refrigeration.** (3-2-4). 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. The student will explain application and conversion procedures "SNAP" (Significant New Alternative Refrigeration Program) of refrigerants related to specific systems. Prerequisite: Refrigeration Principles, Electricity Principles.

**HART 1445. Gas and Electric Heating.** (3-2-4). 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. Prerequisite: Refrigeration Principles, Electricity Principles.

**HART 1501. Electricity Principles.** (4-4-5). 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. The student will exhibit knowledge of basic principles of electricity, electrical current, circuitry, and A/C devices; apply Ohm's law of electrical calculations; perform electrical continuity, voltage, and current tests with appropriate meters; and demonstrate electrical safety. Prerequisite: None.

**HART 1507. Refrigeration Principles.** (4-4-5). 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. Prerequisite: None.

**HART 2434. Advanced A/C Controls.** (3-2-4). Methods for troubleshooting electrical control devices and control circuits including correctly wiring electrical components. The student will troubleshoot complex electrical control devices; troubleshoot control circuits; connect wiring for various control circuits; and apply advanced A/C control concepts. Prerequisite: Refrigeration Principles, Electricity Principles.

**HART 2436. Troubleshooting.** (3-2-4). 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. The student will test and diagnose components, systems, and accessories; and exhibit knowledge of system's sequence of operation, accessory applications, and component operation. Prerequisite: Refrigeration Principles, Electricity Principles.

**HART 2545. Air Conditioning Systems Design.** (4-4-5). 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 or other load calculation f