

EFFECTIVE FEBRUARY 1, 2012

- Added to **Program Offerings** beginning on page 32 of the 2010/2011 Bryan College catalog:

Topeka Campus only

HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION TECHNOLOGY

ASSOCIATE OF APPLIED SCIENCE DEGREE PROGRAM

Completion Time: Seven Quarters*

The Heating, Ventilation, Air Conditioning and Refrigeration Technology Associate of Applied Science Degree Program is designed to prepare the successful graduate with the theory and working knowledge to work in the field as an entry-level Air Conditioning, Heating and Refrigeration technician or other field related industries. Students preparing for a career in the field of heating, air conditioning and refrigeration will study residential, commercial, and industrial applications.

Certification related courses support requirements for EPA-Approved Section 608 Certification. This certification is a credential that is needed to service building air conditioning and refrigeration systems and to purchase refrigerant containers greater than 20 pounds. Passing the certification exam is not a requirement of the program.

Required Support Courses			
<i>Course</i>	<i>Course Name</i>	<i>Quarter Credit Hours</i>	<i>Required Credits</i>
CA100	Introduction to Computer Software Management Φ	4.5	18
CA110	Introduction to Computer Applications Φ	4.5	
CA120	Strategies for Success Φ	4.5	
GEN101	Introduction to Algebra Φ	4.5	

Required Core Courses			
<i>Course</i>	<i>Course Name</i>	<i>Quarter Credit Hours</i>	<i>Required Credits</i>
HV112	Basic Electricity for HVAC/R	9.0	54
HV114	Basic Refrigeration for HVAC/R	9.0	
HV215	Residential Air Conditioning / Residential Geothermal Systems	9.0	
HV216	Residential Heating	9.0	
HV217	Commercial Air Conditioning / Commercial Geothermal Systems	9.0	
HV218	Commercial Refrigeration	9.0	

Required General Education Courses			
<i>Course</i>	<i>Course Name</i>	<i>Quarter Credit Hours</i>	<i>Required Credits</i>
GEN120	Composition I Φ	4.5	22.5
GEN130	Introduction to American Politics Φ	4.5	
GEN140	Psychology Φ	4.5	
GEN180	Technical Writing Φ	4.5	
GEN200	College Algebra Φ	4.5	

Total Quarter Credit Hours Required			94.5
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Φ Taught via Traditional and Non-Traditional Instruction

- The following table replaces the table under **Books and Supplies** on page 4 of the 2010/2011 Bryan College catalog:

Business & Criminal Justice Courses	\$375.00 per quarter
Computer Network/Programming Courses	\$510.00 per quarter
Fitness and Wellness Courses	\$435.00 per quarter
Medical Courses	\$435.00 per quarter
HVAC/Trades	\$435.00 per quarter

- Added to **Course Descriptions** beginning on page 63 of the 2010/2011 Bryan College catalog:

HV112 Basic Electricity for HVAC/R

9 Credit Hours

This course includes construction safety rules and regulations; reviews basic construction mathematical functions and identifies tools widely used across the construction craft fields. It familiarizes trainees with techniques for reading and using blueprints, specifications, and shop drawings; discusses employability in the construction field; and addresses on-the-job communication skills within the craft professions. Additionally, it teaches power generation and distribution, and electrical components; explains the theory of solid-state electronics, as well as the operation, use and testing of the various electronic components used in HVAC; and covers transformers, single-phase and three-phase power distribution, capacitors, the theory and operation of induction motors. The student learns how to solve problems involving the measurement of lines, area, volume, weights, angles, pressure, vacuum, and temperature. **Prerequisites:** CA100 Introduction to Computer Software Management, CA110 Introduction to Computer Applications, and CA120 Strategies for Success.

HV114 Basic Refrigeration for HVAC/R

9 Credit Hours

Presenting the basic principles of heating, ventilation, and air conditioning, this course covers heat transfer, refrigeration, and pressure-temperature relationships. It teaches tools, materials, and safety precautions and depicts step-by-step procedures for soldering and brazing piping; covers the selection, preparation, joining, and support of copper and plastic piping and fittings; introduces the basic principles, processes, and devices used to control humidity and air cleanliness; and presents indoor air quality and its effect on the health and comfort of building occupants. It discusses techniques for reading and using blueprints, specifications, and shop drawings. **Prerequisites:** CA100 Introduction to Computer Software Management, CA110 Introduction to Computer Applications, and CA120 Strategies for Success.

HV215 Residential Air Conditioning / Residential Geothermal Systems

9 Credit Hours

Explaining the factors that affect the heating and cooling loads of a building, this course describes the process by which the heating and cooling loads are calculated; explains air properties, related gas laws, and psychrometric principles and charts; and introduces the trainee to various heat recovery/reclaim devices and energy reduction apparatuses. It explains how to analyze circuit diagrams for electronic and microprocessor-based controls and covers the operation, testing, and adjustment of conventional and electronic thermostats, as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. It describes the purpose of planned maintenance and outlines the procedures for servicing gas and oil furnaces, electric heating equipment, cooling equipment, and heat pumps. Students will also learn the principles of Geothermal energy as it relates to residential applications including designing a Geothermal system. **Prerequisites:** CA100 Introduction to Computer Software Management, CA110 Introduction to Computer Applications, and CA120 Strategies for Success, HV112 Basic Electricity for HVAC/R, HV114 Basic Refrigeration for HVAC/R.

HV216 Residential Heating

9 Credit Hours

This course focuses on heating fundamentals; the types of furnace designs and their components and presents the basic procedures for installing and servicing furnaces. It describes the tools and instruments used in trouble-shooting gas heating appliances and teaches the principles of fossil-fuel furnace venting; covers various types of iron and steel pipe and fittings and provides step-by-step instructions for cutting, threading, and joining ferrous piping. It additionally presents the operation and testing of electric furnaces and their components and reviews the operation of electric heating appliances. It covers the principles of reverse cycle heating; describes the operation of the various types of heat pumps and reviews heat pump operation and heat pump control circuits. **Prerequisites:** CA100 Introduction to Computer Software Management, CA110 Introduction to Computer Applications, and CA120 Strategies for Success, HV112 Basic Electricity for HVAC/R, HV114 Basic Refrigeration for HVAC/R.

HV217 Commercial Air Conditioning / Commercial Geothermal Systems

9 Credit Hours

This course describes air distribution systems and their components, air flow measurements, ductwork installation principles, and the use of instruments for measuring temperature, humidity, pressure, and velocity and covers procedures for the startup of hot water and steam heating, chilled water, and forced air distribution systems. It covers operating principles, piping systems, preventive maintenance, and servicing of boilers, chillers, chilled water systems, steam systems, and steam traps and describes the systems, equipment, and operating sequences used in a variety of commercial airside system configurations. It also explains how computers and microprocessor controls are used to manage zoned HVAC systems. Students will also learn the principles of Geothermal energy as it relates to commercial applications including designing a Geothermal system. **Prerequisites:** CA100 Introduction to Computer Software Management, CA110 Introduction to Computer Applications, and CA120 Strategies for Success, HV112 Basic Electricity for HVAC/R, HV114 Basic Refrigeration for HVAC/R.

HV218 Commercial Refrigeration

9 Credit Hours

This course covers the operation of refrigeration systems, with emphasis on systems used in cold storage and other commercial food preservation applications and presents the basic techniques and equipment used in troubleshooting cooling equipment. It explains the operating principles of the different types of compressors used in comfort air conditioning systems and offers the operating principles, applications, installation, and adjustment of the various types of fixed and adjustable expansion devices. It presents the entire basic refrigerant handling and equipment servicing procedures that a technician must know in order to service HVAC systems and covers the application and installation of various types of fasteners, gaskets, seals, and lubricants and the adjustment of different types of belt drives, bearings, and couplings. Prerequisites: CA100 Introduction to Computer Software Management, CA110 Introduction to Computer Applications, and CA120 Strategies for Success, HV112 Basic Electricity for HVAC/R, HV114 Basic Refrigeration for HVAC/R.