

PHCC Academy™

HVAC 401 Syllabus

Course Contact for Registration and Non-LMS Questions

State Chapter Partner

Refer to <http://foundation.phccweb.org> and search for PHCC Academy page for listing

Course Contact for Technical Problems in Absorb LMS

PHCC Academy™ Staff

academy@naphcc.org

Prerequisites

HVAC 101, 201 and 301 or equivalent

Welcome to the PHCC Academy™ Online Apprenticeship-Related Instruction Program!

This program is designed to provide students who cannot attend classes in a traditional apprentice program with the same opportunity to learn the textbook fundamentals of the trade. This training course must be supplemented by your employer, through both technical assistance and on-the-job training in each area of instruction in the book.

Course Goals

- To familiarize students with heat pump systems and components
- To provide students with in-depth knowledge about air-source heat pumps
- To provide students with in-depth knowledge about geothermal heat pumps
- To introduce students to energy and efficiency calculations and applications

Student Responsibilities

- Complete work in a timely manner.
- Read all information and assignments within the learning management system before starting the course.
- Complete all tests in this course as closed-book. Students are on the honor system.
- Complete all assignments with a passing grade of 70 percent or higher.
- Complete the course in 1 year (12 months) or request a 6-month extension before the course expiration date.
- Maintain records of on-the-job training completed.

Employer Responsibilities

- Ensure that all students enrolled are proficient in reading and writing in English at a high school level and possess the self-motivation to complete internet-based coursework.
- Register apprentices with the U.S. Department of Labor, either through your own apprenticeship program or through your PHCC State Chapter Partner's registered apprenticeship program.
- Track the apprentice's on-the-job training hours and document such hours. Documentation records must be maintained by the employer for the duration of the apprentice's employment and must be retained as required by the U.S. Department of Labor.

- Ensure that apprentices are paid a progressively increasing schedule of wages and fringe benefits based on a percentage of the current journey worker wage rate as specified in the Standards of Apprenticeship for the program under which the apprentice is participating.

State Chapter Partner Responsibilities

- Register and enroll students in the appropriate courses on the learning management system.
- Assist students with ordering textbooks for their courses.
- Act as the primary point of contact for students and employers who register for courses in their state.
- Serve as the liaison between the PHCC Academy and employers of apprentices enrolled in the program in their state.

PHCC Academy Responsibilities

- Ensure that the federal Department of Labor approval for the apprenticeship program is kept current and is updated as needed.
- Administer the learning management system and course offerings for the eLearning program. This includes developing course content and placing it into the learning management system.
- Provide students with learning management system usernames and passwords.
- Provide all administrative functions on the learning management system.
- Coordinate any Advanced Placement Testing with PHCC State Chapter Partners.
- Provide a completion letter and certificate to students upon successful completion of each course.

Required Textbook (Purchased Separately)

Hohman, John (2012). HVACR 401, 1st ed. Clifton Park, NY: Delmar, Cengage Learning.

Assignments

Unit 1 – Review of Basic Refrigeration Related to Heat Pumps

Read Chapter 1 in the HVACR 401 textbook.

Video – What is Superheat?

Video – What is Subcooling?

Chapter 1 Review PowerPoint

Read Chapter 2 in the HVACR 401 textbook.

Chapter 2 Review PowerPoint

Read Chapter 3 in the HVACR 401 textbook.

Chapter 3 Review PowerPoint

Read Chapter 4 in the HVACR 401 textbook.

Chapter 4 Review PowerPoint

Unit 1 Exam

Unit 2 – Heat Pump Components and Fundamentals

Read Chapter 5 in the HVACR 401 textbook.

Video – Wiring a Heat Pump Thermostat

Chapter 5 Review PowerPoint

Read Chapter 6 in the HVACR 401 textbook.

Video – Heat Pump Components

Chapter 6 Review PowerPoint

Read Chapter 7 in the HVACR 401 textbook.
Video – Common HVAC Motors
Chapter 7 Review PowerPoint
Read Chapter 8 in the HVACR 401 textbook.
Chapter 8 Review PowerPoint
Read Chapter 9 in the HVACR 401 textbook.
Video – Defrost Sequence of Operation
Chapter 9 Review PowerPoint
Unit 2 Exam

Unit 3 – Electrical Schematics and Heat Pump Installation and Maintenance

Read Chapter 10 in the HVACR 401 textbook.
Chapter 10 Review PowerPoint
Read Chapter 11 in the HVACR 401 textbook.
Chapter 11 Review PowerPoint
Read Chapter 12 in the HVACR 401 textbook.
Chapter 12 Review PowerPoint
Electricity and Heat Pumps Review Game
Unit 3 Exam

Unit 4 – Troubleshooting and Systems

Read Chapter 13 in the HVACR 401 textbook.
Video – Troubleshooting Outdoor Fan Motor
Video – Troubleshooting a Variable Speed Blower Motor
Chapter 13 Review PowerPoint
Read Chapter 14 in the HVACR 401 textbook.
Chapter 14 Review PowerPoint
Read Chapter 15 in the HVACR 401 textbook.
Chapter 15 Review PowerPoint
Unit 4 Exam

Unit 5 – Geothermal Systems

Read Chapter 16 in the HVACR 401 textbook.
Video – How Geothermal Heat Pumps Work
Chapter 16 Review PowerPoint
Read Chapter 17 in the HVACR 401 textbook.
Chapter 17 Review PowerPoint
Read Chapter 18 in the HVACR 401 textbook.
Chapter 18 Review PowerPoint
Unit 5 Exam

Unit 6 – Pumps and System Checks

Read Chapter 19 in the HVACR 401 textbook.
Chapter 19 Review PowerPoint
Read Chapter 20 in the HVACR 401 textbook.
Chapter 20 Review PowerPoint
Pumps and System Checks Review Game
Unit 6 Exam

Unit 7 – Geothermal Installation and Maintenance

Read Chapter 21 in the HVACR 401 textbook.

Video – Geothermal Vertical Loop Installation

Video – Flushing, Purging, and Filtering the Geothermal Loop

Chapter 21 Review PowerPoint

Read Chapter 22 in the HVACR 401 textbook.

Chapter 22 Review PowerPoint

Unit 7 Exam

Unit 8 – Water Treatment and Indoor Air Quality

Read Chapter 23 in the HVACR 401 textbook.

Video – Testing a Water/Refrigerant Coax

Video – Measuring Superheat and Subcooling

Video – Troubleshooting a TXV

Video – Leak Testing an Air Coil

Chapter 23 Review PowerPoint

Read Chapter 24 in the HVACR 401 textbook.

Chapter 24 Review PowerPoint

Unit 8 Exam

Final Exam

Course Evaluation