



Course Outline

2026-2027 Catalog

HVAC 32 - Advanced HVACR Service

Catalog Description

Transfer Status: CSU

Prerequisite: HVAC 21, HVAC 22, HVAC 23

Corequisite: HVAC 31, HVAC 33

Unit(s): 5.00

Lecture: 51.00 Contact hours/102.00 Out of class hours/153.00 Total hours/3.00 Unit(s)

Lab: 102.00 Contact hours/0.00 Out of class hours/102.00 Total hours/2.00 Unit(s)

Total: 153.00 Contact hours/102.00 Out of class hours/255.00 Total hours/5.00 Unit(s)

Course Description: This course is designed to provide pre-employment training in Heating, Ventilation, Air Conditioning and Refrigeration (HVACR) systems for industrial trades. Emphasis will be placed on developing safety skills, troubleshooting skills on electrical, refrigerant, heat pumps, airflow diagnostics, commercial refrigeration systems, and customer relations. These areas of instruction will be applied in several hands on performance lab exercises. This course is part of the National Center For Construction Education and Research (NCCER) core curriculum qualification.

Objectives

Upon successful completion of this course, the student should be able to:

1. Practice safety skills that are required on job-sites.
2. Explain how to troubleshoot common control circuits and load components.
3. Describe the operation of the refrigeration cycle and identify problems that can occur.
4. Compare heat pumps to standard cooling systems and describe their operating cycles.
5. Explain how to conduct a combustion analysis on a gas furnace.
6. Identify common zoning systems and describe the basic approach to troubleshooting.
7. Identify and describe common refrigeration controls.
8. Explain the service technician's role in customer relations.

Course Content

Topic Titles / Suggested Time Topic

Lecture

<u>Topics</u>	<u>Lec Hrs</u>
Introduction and Safety	1.50
Trouble Shooting Electrical	11.50
Troubleshooting Refrigerant	7.00
Troubleshooting Heat Pumps	6.00
Gas Heat Diagnostics	6.00
Airflow Diagnostics	6.00
Retail & Commercial Refrigeration	6.00
Customer Relations	7.00
Total Hours: 51.00	

Lab

<u>Topics</u>	<u>Lab Hrs</u>
Introduction and Safety	1.50
Trouble Shooting Electrical	18.50
Troubleshooting Refrigerant	16.00
Troubleshooting Heat Pumps	12.00
Gas Heat Diagnostics	12.00
Airflow Diagnostics	12.00
Retail & Commercial Refrigeration	14.00
Customer Relations	16.00
Total Hours: 102.00	

Methods of Instruction

- A. Demonstrations
- B. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- C. Laboratory Experiments
- D. Lecture
- E. Multimedia Presentations

Methods of Evaluation

- A. Exams/Tests
- B. Quizzes
- C. Homework
- D. Lab Projects

Examples of Assignments

Reading Assignments

1. Read the module introducing airflow diagnostics and be prepared to discuss in class.
2. Read assigned trade journal article and be prepared to discuss in class.

Writing Assignments

1. Write an order of operations for variable refrigerant flow design.
2. Write a two-page essay, explaining how the trade journal article can be implemented in workplace safety and how it relates to the class.

Out-of-Class Assignments

1. Research online the proper process for designing basic control circuits using manufactures publications and be prepared to discuss in class.
2. Read module 5 and then answer the review questions at the end of the module.

Recommended Materials of Instruction

National Center for Construction Education and Research (NCCER). (2018). Heating, Ventilating, and Air Conditioning - Level 3.. *Pearson Education INC.*

Other Learning Materials

All tools listed in the HVACR Program Guide.

Minimum Qualifications

Air Cond,Refrig,Heating
Industrial Technology

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