



Course Outline

2026-2027 Catalog

HVAC 43 - Advanced Internship with Local Trade Company

Catalog Description

Transfer Status: CSU

Prerequisite: HVAC 31, HVAC 32, HVAC 33

Corequisite: HVAC 41, HVAC 42

Unit(s): 8.00

Lecture: 68.00 Contact hours/136.00 Out of class hours/204.00 Total hours/4.00 Unit(s)

Lab: 204.00 Contact hours/0.00 Out of class hours/204.00 Total hours/4.00 Unit(s)

Total: 272.00 Contact hours/136.00 Out of class hours/408.00 Total hours/8.00 Unit(s)

Course Description: This course is designed to further develop and polish the skills required to succeed in the Heating, Ventilation, Air Conditioning and Refrigeration (HVACR) systems industry. The student will develop personal and general safety skills, enhance the communication skills required to begin diagnosis of equipment and system operations, perform system maintenance, and ultimately complete repairs ranging from a simple adjustment, to a compressor replacement. Experiences in this course are intended to prepare students to pass the North American Technician Excellence (NATE) certification and the Environmental Protection Agencies Refrigerant Certification Examination. Successful completion of both exams is required to pursue a career in the HVAC field. This is part of the National Center For Construction Education and Research (NCCER) Heating, Ventilation, and Air Conditioning curriculum qualification.

Objectives

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

1. Practice safety skills that are required to work safely in the trade.
2. Demonstrate the use and care of appropriate personal protective equipment (PPE).
3. Identify and describe the operation of various styles of systems. Energy Management control systems, Hydronic, Variable Refrigerant Flow and ductless systems.
4. Perform Manual J load calculations and Air Distribution design and installation best practices.
5. Identify and describe the main characteristics of common refrigerant systems.
6. Explain how to incorporate leadership skills into work habits, communications, motivation, team-building, problem-solving, and decision-making skills.
7. Demonstrate a basic understanding of the planning process, schedule, and cost and resource control.

Course Content

Topic Titles / Suggested Time Topic

Lecture

<u>Topics</u>	<u>Lec Hrs</u>
Introduction and Safety	1.50
Fundamentals of Crew Leadership	6.50
Customer Relations and Proper Communication	6.00
Basic Heating and Cooling Design Practices	6.00
Building and Energy Management Systems (EMS)	6.00
Equipment Commissioning and Shut down procedures	6.00
Importance of Energy Conservation Equipment	6.00
Basic Indoor Air Quality Specifications and requirements	6.00
Understanding Construction Drawings and Specifications	6.00
Basic Repairs on Commercial and Industrial Refrigeration Systems	6.00
Water Treatment Procedures and Specifications	6.00
Regulation Updates Required in the HVACR Industry	6.00
Total Hours:	68.00

Lab

<u>Topics</u>	<u>Lab Hrs</u>
Introduction and Safety	1.50
Fundamentals of Crew Leadership	20.50
Customer Relations	18.00
Basic Heating and Cooling Design Practices	18.00

Topics	Lab Hrs
Building Management Systems	18.00
Implementation System Startup and Shutdown Procedures	18.00
Implementation of Energy Conservation Equipment	18.00
Implementation of Basic Indoor Air Quality Specifications	18.00
Implementation of Construction Drawings and Specifications	18.00
Basic Repairs on Commercial and Industrial Refrigeration Systems	18.00
Water Treatment Procedures and Specifications	18.00
Regulation Updates Required in the HVACR Industry	20.00

Total Hours: 204.00

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 article on customer relations 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 diagnosing a heat pump problem and reporting the findings to the customer.
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 setting up an electrical circuit using manufactures publications and be prepared to discuss in class.
2. Read module 11 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 4. *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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