



## Course Outline

2026-2027 Catalog

### HVAC 13 - Trade Electricity

#### Catalog Description

**Transfer Status:** CSU

**Corequisite:** ITEC 55, HVAC 11, HVAC 12

**Unit(s):** 4.00

**Lecture:** 34.00 Contact hours/68.00 Out of class hours/102.00 Total hours/2.00 Unit(s)

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

**Total:** 136.00 Contact hours/68.00 Out of class hours/204.00 Total hours/4.00 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 basic safety skills, fundamentals of electricity, electrical theory, knowledge of electrical measuring instruments used in industry, and identification of electrical components. 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. Describe the fundamentals of electricity.
3. Explain basic electrical theory.
4. Identify the electrical measuring instruments used in HVACR work and describe their uses.
5. Identify electrical components used in HVACR systems and describe their functions.

#### Course Content

##### Topic Titles / Suggested Time Topic

##### Lecture

| <u>Topics</u>             | <u>Lec Hrs</u> |
|---------------------------|----------------|
| Introduction and Safety   | 2.50           |
| Electrical Safety         | 5.00           |
| AC, DC Current and Phases | 5.50           |
| Electrical Components     | 5.50           |
| Motors and Circuits       | 5.00           |
| Electrical Tools          | 4.00           |
| Wiring Diagrams           | 6.50           |
|                           |                |
| <b>Total Hours: 34.00</b> |                |

##### Lab

| <u>Topics</u>              | <u>Lab Hrs</u> |
|----------------------------|----------------|
| Introduction and Safety    | 6.00           |
| Electrical Safety          | 20.00          |
| AC, DC Current and Phases  | 20.00          |
| Electrical Components      | 20.00          |
| Motors and Circuits        | 15.00          |
| Electrical Tools           | 6.00           |
| Wiring Diagrams            | 15.00          |
|                            |                |
| <b>Total Hours: 102.00</b> |                |

#### 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

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

## Examples of Assignments

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### Reading Assignments

1. Read the module on Ohm's Law 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 the flow of electricity through an HVAC unit.
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. Research the basic electrical components found in a HVAC unit and write a one-page essay.

## Recommended Materials of Instruction

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National Center for Construction Education and Research (NCCER). (2018). Heating, Ventilating, and Air Conditioning - Level 1. *Pearson Education INC.*

### Other Learning Materials

All tools listed in the HVACR Program Guide.

## Minimum Qualifications

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Air Cond,Refrig,Heating  
Industrial Technology

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